The Therapeutic Gazette

Whole Series, Vol. XLVI — DETROIT, MICH., FEBRUARY 15, 1922 — Third Series, Vol. XXXVIII, No. 2

Original Articles

The Surgical Treatment of Papilloma of the Bladder

BY THOMAS C. STELLWAGEN, JR., M.D.

Associate Professor of Genito-urinary Surgery in the Jefferson Medical College; Genito-urinary Surgeon, Philadelphia General Hospital, Philadelphia

Some years ago I was taken to task for advocating a radical procedure in dealing surgically with suspicious papillomata of the bladder. In certain cases an open operation was advised, in those patients where there was doubt as to the efficacy of destruction by means of the high-frequency current delivered by a wire through the cystoscope (fulguration). The views were criticized as ultra-radical, and the consensus of opinion was that more recurrences followed the cutting procedure than after the use of the electric current by means of the wire and the cystoscope.

It seems to-day the surgical pendulum has begun to swing back to the cutting or open operation. By this we mean the exposure of the tumor and delivering the attack through an ample suprapubic cystotomy. This method undoubtedly gives the operator a better chance to apply fulguration, cauterization, or radium, and, if necessary, partial resection of the portion of vesical wall from which the pedicle springs.

It is a perfectly sound surgical procedure to resort to fulguration. It is and has been a great step forward in the cure and destruction of certain types of papillomata. It is unquestionably the best method of procedure in those cases wherein it is safe and practical; but should there be a reasonable doubt as to its ability either to destroy the mass completely or where because of some other obstacle it cannot be thoroughly used, then it becomes a very poor makeshift and is a feeble substitute for the radical operation. The cystoscopist often has a difficult problem on his hands to make a positive diagnosis of the character of the growth. It is one of the most important questions that the examining surgeon has to deal with, for so much depends upon clean-cut surgical judgment. The cystoscope, by long and continued experience in its use, in the hands of the master becomes more and more an instrument of precision; but even the surgeon of broad training may and often does err in his judgment as to the type of growth and its extent. Many cases are so-called border-line tumors undergoing either a tardy or a rapid transformation into malignancy. In such cases the extent of the tumor, the problem of concomitant cystitis, hemorrhage, bullous edema, and other difficulties so hamper one that a definite answer upon the question of its malignancy cannot be given. However, when these states are present the rule I have followed when further data are unobtainable is to consider it a potential malignant mass. Punches have been devised for the purpose of removing a portion of the growth through the cystoscope. This procedure may give very

definite knowledge. On the other hand it may and often does mislead. The portion so removed may be composed of benign cellular elements, for it might be a transitional tumor. In obtaining the punched specimens they should be taken from an area close to the base, or, if there be ulceration, it should be cut so that it includes the margin of the ulcer. Again, some cases that are apparently suitable for fulguration are later found unsuited for this procedure. Many difficulties can arise, a few of which are as follows:

1. Pain may be so great as to prevent the instrumentation, and uncontrollable by anything but general anesthesia. General anesthesia cannot always be used, for some cases are so depleted from loss of blood that the circulatory system is but a broken reed upon which to lean.

2. The irritation from instrumentation and manipulation may cause a very severe cystitis. This is associated with bullous edema and swelling, which so mask the growth that fulguration is impossible.

3. Some instrumentations are followed by severe febrile attacks that may eventuate in uremia and death. This complication is a very important one. I have seen several cases that terminated fatally from suppression apparently induced by urinary fever coming on after cystoscopy.

4. The pedicle of the growth may vary in shape, viz.: we may think we have a pedunculated neoplasm, but after destroying the presenting margin of the mass it will be found that the posterior surface springs from a broad sessile base.

These are but a few of the obstacles the surgeon may encounter, but when they do confront him fulguration per cystoscope per urethram is a questionable substitute for the open operation.

A cystoscopist is human, and all humans err. This percentage of error in judgment simply cannot be eliminated. Even the most careful and painstaking technician fails. Many of us don't like to admit it, but it is true. Personally I don't accord much value to an examiner's opinion unless he has literally looked into hundreds of bladders. I prefer to make several cystoscopic examinations before deciding which operative course to pursue, unless, of course, it is a very frank case for one or the other methods of attack.

It is amazing the difference in shape and extent of the growth as seen after opening the bladder and the picture we had drawn in our mind's eye from the cystoscopic examination.

A very distinct advantage of the open operation is the ease with which hemorrhage can be controlled. When it occurs where the bladder has not been opened it is often troublesome, dangerous, and usually followed by infection and cystitis. Radium capsules, needles and emanation seeds are also more readily and definitely applied through the suprapubic route. Radium needles can be inserted where the greatest good can be accomplished. Radium in my cases has not produced the brilliant results that others have had from its use in bladder surgery. I feel, however, that it is a medium that should be resorted to. It most certainly should be applied in conjunction with one who has had a broad experience in its use. I have seen peculiar reactions and aberrant states of shock coming on both early and late after its use. Physicists and others have tried to explain the causes of such conditions, but as yet the problem is unsolved. Therefore I always insist that it be applied by an expert. I wish to go definitely on record in condemnation of the imago cystoscopist and radium applier—the former who gives an opinion unseasoned by experience, and the latter one who plays with an element potent to do great harm when misapplied.

In one case death occurred after radium was used. This man went into a peculiar state of shock in which all methods of combat availed nothing. It seemed to be an admixture of cardiovascular plus pulmonary and nervous disturbance, and he simply died. A post-mortem was not obtained. I firmly believe the radium caused his shock that eventuated in death. At least there was no other definite cause.

Other unhappy sequelæ I have seen; one

in particular. In this case the patient had a border-line mass in the bladder. A suprapubic operation was advised, which was rejected. He consulted elsewhere, and was fulgurated per cystoscope by high-frequency discharges. This availed him nothing, in fact aggravated an already malignant condition. This procedure was followed by great pain, extreme and continued discomfort, with evident rapid growth of the tumor. He consulted still another surgeon, who did a suprapubic cystotomy and applied radium. This was followed by cessation of pain and apparent relief of other symptoms. The bladder, however, failed to close, and in about a month after the radium was used he developed a rectovesical fistula that gave him much discomfort and pain. The fistula was complicated by marked fibrous change almost board-like in its rigidity. He succumbed in a short time to what was apparently an ascending infection of the kidneys eventuating in urinary suppression.

I have seen several other cases that apparently had an overdose or else the tissues were unusually susceptible to its potency. In one it was applied for malignancy of Cowper's gland. In this case a urethral fistula accompanied by marked fibrous change resulted. I believe the neoplasm was destroyed, but this case died and the complication of the fistula did not add to his earthly comfort.

These cases are not mentioned in condemnation of the element, but merely to admonish great care in its use, and to force home the necessity for extreme caution when it is used in the bladder or urethra. In these parts so much suffering and misery can be caused by a misstep that I often feel we are wrong in attempting the impossible. Poor man is about the only animal that is not allowed to die in peace.

Cross-fire *x*-ray given by an efficient radiographer I have faith in and use as a routine. It again must be applied by one well versed in the technique of exposure and dosage.

These remarks call to mind an admonition given to my class by Prof. W. W. Keen. It was called forth by a discussion upon the electrical treatment of cancer. Dr. Keen said: "Gentlemen, to date there is but one possible cure for cancer, and that is cold steel administered by a bold and fearless hand." I believe these words are almost as true to-day as they were when said by the master surgeon nineteen years ago.

In short, the treatment of cancer of the bladder resolves itself into a stern combat that should be waged by the surgeon with unfailing energy. He should fight it into and out of the last trench; always, however, permitting his surgical judgment to tell him how far he dare go. Do not make the cure worse than the disease.

The method I have used with best results in the clinic of the Jefferson Hospital is as follows:

The case is first very carefully studied by means of the cystoscope and the *x*-ray if necessary to determine the position and extent of the growth, the presence of stone, diverticulum, or other complications. Blood coagulation time and a hemoglobin estimation are important considerations. Kidney efficiency may be of use, but blood chemistry gives the surgeon a better insight into the eliminative powers of his subject. Eight to twelve hours before operation a high purgative enema is administered and the lower bowel emptied. Nothing but water or liquid food is given for at least twelve hours before operation. Three or four hours before operation the rectum is washed out by a soapsuds enema or lavage. The operative field is prepared by a clean shave and careful scrubbing, followed by its protection by moist bichloride dressings. The case is again scrubbed upon the operating table and solutions used. I lay particular stress upon the use of the 70-per-cent alcohol.

The suprapubic area is exposed, a catheter is inserted into the bladder and the organ given a very gentle irrigation of salt solution or boric acid, care being taken not to overdistend the viscus. After washing, the bladder is then gently distended until if possible it is palpable as a globular mass above the symphysis pubis. The organ is

then exposed by an ample incision in the median line, the muscles separated, and the prevesical fat and peritoneum in the space of Retzius brought into view. These are carefully and gently retracted by the index-finger covered by a layer of gauze, which prevents their slipping away. The lateral attachments of the bladder are thus fairly well freed down on to the sides. This permits of a good wide exposure, and unless the subject is too obese it is surprising how motile the bladder becomes after the fluid is evacuated. The peritoneum is protected above by a small strip of iodoform gauze that packs it away from the operative field. Small packs may also be inserted laterally. Hemorrhage must be controlled by ligature or suture ligature, for after the organ is opened this procedure becomes more difficult. We now have the bladder practically surrounded by a cofferdam of gauze. Next, I insert two or four heavy silk stay sutures by means of fascia needles into the bladder wall anteriorly, one or two on either side of the line of incision. These should be stuck at right angles to the muscular fibers and pass completely into and out of the bladder through all its coats. If inserted parallel to the muscular fibers they generally tear out. The bladder is now opened by a fairly long incision. If you have marked infection it is well to empty it by puncture with a large trocar and cannula, thus preventing a deluge of infected fluid into the wound area. After it is opened, providing it is grossly infected, the silk stay sutures are pulled gently upon and the wound opened, the inside cleansed and dried by gauze sponges, followed by mopping with some mild germicidal solution. I use nitrate of silver 10 grs. to ℥j.

Hemorrhage from the vesical wall is controlled by carefully applied ligatures.

The bladder incision is now pulled upon through the silk stay sutures and the growth exposed. A finger may be gently inserted within the organ to outline the extent of the growth. But my rule is not to disturb or squeeze the mass by unnecessary manipulation until it has had at least its superficial epithelial elements destroyed. Papillomata are like sponges, and when roughly or unnecessarily handled they undoubtedly exude myriads of cells that may become attached to other areas, hence I prefer to burn down the growth as far as possible at this time and with the minimum amount of manipulation. After the projecting portion of the growth has been destroyed by the actual cautery I then proceed as follows: Gauze layers are carefully inserted upon the mucous membrane at the points where we wish to retract, and suitable blunt retractors are introduced and traction exerted so as to afford the best view. It is found that in most cases the mass occupies a position to the inner or outer side of the ureter and grows backward. Therefore, the surgeon can get a better view of the field by rolling a suitable amount of gauze pack into a ball which is moistened and placed in the bladder fundus well above the growth. A long, broad, blunt retractor has its tip placed upon the gauze ball, and an assistant then pushes down gently toward the rectum and at the same time pulls upward toward the fundus. This puts the organ upon slight tension, smoothing out the folds and affording a good view. Should the position of the growth require lateral or downward traction of the bladder wall the same technique as described is usually applicable in these positions. More than one retractor may be so placed. The bladder wall surrounding the growth is now carefully examined, and any suspicious areas in it are definitely located. A short curved fascia needle armed with No. 2 or 3 iodized catgut is passed one-third or one-half way around the mass and well beyond the pedicle of the growth, leaving a continuous suture dipping in and out of the bladder coats. One or two more of these sutures are inserted until the entire area is encircled. The ends are brought out of the wound and properly secured. These sutures are not tied, but act as handles in the subsequent manipulation and also help by traction upon them in the control of hemorrhage. An incision fairly well away from the base and surrounding the entire growth is now made down through as many of the bladder coats as the operator

deems advisable. Here it may be well to speak of growths involving the ureteral outlets or the intravesical portion of the ureter.

It has been my experience that the ureter, if cut, has a very strong tendency to reëstablish itself at its cut point even though no attempt at implantation or repair is made. But it is not advisable to trust to luck. I make it a rule to free the ureter as follows: If the growth directly overlies it, then by means of the blade of the electric cautery at a cutting heat the ureter is exposed and by dry dissection is freed from its attachments. This can be done excepting where there is marked induration, and even here much can be accomplished by patience and care.

If the ureter is to be fixed at a new point in the bladder, it may be that its new attachment will kink it. This must not be, and can be determined by feeling with the finger in its former bed, and a position selected for its attachment that obviates this danger as much as possible. It will be found that the angulation of the tube can be prevented by a little further dry dissection and gathering together of the tissues in the cut exposing the ureter by one or more buried catgut sutures. Should the ureteral structure be involved by the growth the suspicious end can be removed and the free end of the ureter split longitudinally and fixed to the bladder wall by one or more catgut sutures. The incision exposing the ureter is now repaired in the apparently healthy part of the bladder wall by catgut sutures. Slitting of the ureter before implantation is not apparently necessary, but I feel that it is safer and sounder judgment. On the other hand it undoubtedly enhances the danger of an ascending infection.

We are now ready to remove the growth. This may be done by cutting, by snaring, by fulguration, or by cooking. I prefer resecting as much as possible and cooking of the area left, including its margins. For the cooking I have found the cauteries shown in Fig. 1 the best for several reasons, which I will explain later. The cauteries are fashioned from copper, and it will be noted that they have sufficient bulk of metal to retain the proper cooking heat for a long enough period to allow it to penetrate into the tissues. This I think a most important consideration. The wire shanks are made of soft brass, hard soldered into a drilled socket in the base of the instrument. This permits of bending, which facilitates cauterization of any area in the bladder. They

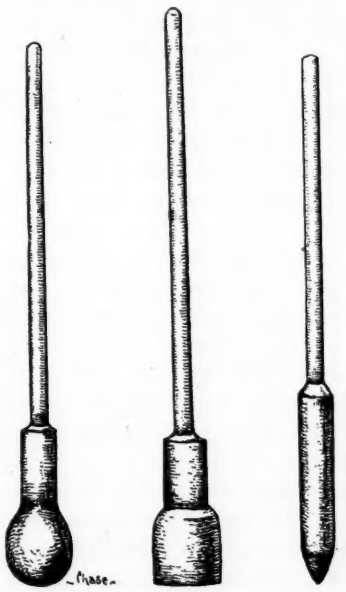

FIG. 1.

can be grasped by a pair of parallel jawed pliers that serve admirably as a handle. These pliers are constructed so that the wire can be passed between the jaws and out between the handles, thereby giving different lengths of shank on the same instrument. Of course if passed too far back the operator's hand would be burned by the projecting end of the wire. The pliers can be obtained at hardware dealers and are inexpensive. The coppers are best heated over a slow blue gas-flame or in a plumber's torch, care being taken to see that the entire bulk of the cautery is heated alike throughout and not merely a superficial heat obtained. For this reason I feel that they should be slowly brought to the proper cooking heat. When we are ready to begin the cooking, the mucous membrane of

the healthy surrounding structures is protected by gauze or sterile wooden spatulæ or retractors. Some have used moist gauze pads, but these are dangerous, for I have seen a mucous membrane steamed and so injured by too long an application of heat. The operator, after seeing that everything is ready for the cooking, now ungloves his left hand and passes the index-finger into the rectum and places it directly beneath the area he wishes to cook. One of the coppers best suited and at a proper black heat is then placed gently upon the area in the bladder and allowed to simmer the structures. The rectal finger is the heat gauge. I have found it best to hold the cautery in position until I feel very slight heat on the tip of the finger within the rectum. The cautery is then removed, leaving a distinct eschar. The tissues are allowed to cool, and any blood or water is swabbed away until the parts are dry, and the cautery reapplied so that the new eschar overlaps the first; and so proceed until the entire suspicious area and margins have been thoroughly cooked, leaving an eschar.

The cooked area is then carefully gone over to see that all suspicious points are properly treated, particular stress being laid upon a careful scrutiny of the margins. The bladder wall is also looked over carefully, and for this purpose I employ a good light and a magnifying glass. Any suspicious areas should be destroyed at this time. The encircling catgut sutures are then gently brought together and the area puckered and the sutures tied; it is not wise to put too great tension upon them, for I am satisfied that they do harm by deeply embedding the eschar, which of course must separate. Hemorrhage is controlled as well as possible by ligature and the cautery. The gauze inserts are then removed carefully so as not to distribute any more free cells than possible. The bladder wall is mopped by some solution that will destroy any attached cells. For this purpose some use resorcin, but nitrate of silver seems to answer.

I have used nitrate of silver, which is washed away by boric acid or salt solution irrigation.

Repair of the bladder wall is now begun, and this should be preceded by a careful search for hemorrhage and its control, and also it is well to carefully wipe the margins with nitrate of silver solution to destroy any epithelial implants that may be present. The edges are approximated by a continuous Lembert suture. This in turn is reënforced by a few interrupted Lembert stitches. Sufficient aperture is left at the fundal end of the incision to provide for drainage and packing, and also to facilitate the insertion of radium needles or emanation seeds.

A pack of iodoform gauze is inserted before the completion of the repair of the bladder wall if necessary, and drainage by a two-way tube is used. The two-way tube makes subsequent irrigation an easier matter. Drainage of the space of Retzius and lateral aspects is provided for by suitable means. Also a small iodoform pack holds the peritoneum up and acts as a drain.

The fascia muscles and skin are partially closed around the tube and gauze by through-and-through silkworm-gut sutures, one of which passes through the drainage tube and holds it *in situ*. The postoperative treatment consists in the combating of shock; rest in bed with the head of same raised about six to twelve inches; the administration of morphine for the pain and restlessness; gentle irrigation of the bladder by saturated boracic acid solution, and at the proper time the application of radium succeeded by cross-fire *x*-ray exposures.

The packing and drainage are left *in situ* a variable time. I have frequently removed them from the bladder in forty-eight hours, and have left them in place as long as eight days. In subsequent dressings it is my custom to place a few drops of chlorolyptus oil upon the packings. It undoubtedly keeps them sweet and keeps down the infection that always follows these operations.

When the patient starts to sit up he should have his abdomen supported by broad strips of adhesive plaster in the form as shown in Fig. 2. These are tied in front over a good gauze spring, and the many

tails act in the same way as a woman's corset lacing, and give support to the abdominal parietes.

It is very important to ward off bronchitis and cough of any kind, for should the patient be harassed by a cough it is not only very painful and weakening, but likewise tends to delay the healing and induce a vesical hernia. See in particular that the patient does not get chilled, and have a competent nurse keep the dressings changed so as to prevent excoriation. For the protection of the skin, I have found nothing better than boric acid ointment.

Watch the urine and keep it bland by large water intake, and should there be, as

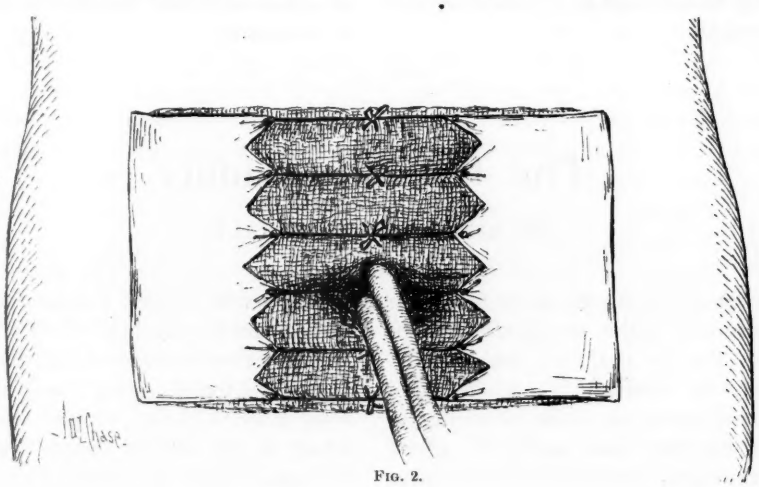

FIG. 2.

there probably will, a deposit of phosphate about the wound, apply a paste of Bulgarian bacillus tablets. I often use a solution of the same as an irrigation, about 10 or 12 tablets to a pint of sterile salt solution or distilled water, this to be given once daily in conjunction with the other irrigations.

I prefer the soldering iron for a cautery, because it is simple. It can be heated to the proper cooking heat, and retains this heat a sufficient time to cook the underlying tissues. It is inexpensive. It is untrammeled by any attached cord, and consequently one's sense of touch is better. The shank permits bending to reach inaccessible areas.

I condemn the electrothermic cautery, because it is complicated and frequently fails to work during the most critical stage of the operation. It is expensive. It does not retain the heat, and the platinum loop is so small that it must be heated to a white heat, which cuts. This heat dissipates almost immediately upon coming in contact with the growth and the surgeon has no means of regulating it. There is not enough heat generated over a broad enough area to control its intensity by a finger in the rectum. Lastly it takes much more time to do a complete cauterization than with the irons.

Fulguration, or electrothermic coagulation, has the same disadvantages as the electric cautery. It, however, is a very convenient method of applying heat. I am by no means convinced that its virtue is due to anything but the heat generated. If it has the great power for penetration that is believed by many, I have not had the success from its use that I have from the actual cautery irons.

SUMMARY.

To summarize the surgical treatment of papilloma of the bladder:

1. Most papillomata of large size are either malignant or undergoing change to cancer.

2. Fulguration is an excellent procedure for a purely benign growth that can be properly fulgurated.

3. Difficulties other than malignancy at times make fulguration useless.

4. The examination of the bladder should be made by a cystoscopist of broad experience.

5. It is believed that the open or suprapubic operation offers better results in doubtful cases.

6. The actual cautery in the form of a modified copper soldering iron gives better control of the cooking than the electric cautery and does it more thoroughly.

7. Extreme care in opening the bladder inhibits dissemination of cancer cells and infection.

8. It is well to remove as much of the base and bladder wall as is consistent with good surgery.

9. The ureter may be transplanted within the bladder by properly freeing it.

10. The ureteral outlet, if cut, will often take care of itself.

11. The use of radium is advised, but it has not in our hands produced the brilliant results that it has in others.

12. It should only be used by an experienced man. It has caused serious trouble.

13. *X*-ray cross-fire is practical and advised.

14. The bladder wall should be carefully examined by means of a magnifying glass to find, if possible, small beginning papillomata, and these treated at once.

15. When possible, operative surgical procedure offers the best chance of a cure in malignancy.

The Irritable Bladder[1]

BY ROBERT M. LEWIS, M.D.

Baltimore

Looming up among the more distressing symptoms with which the gynecologist or urologist has to deal we find bladder irritability—a condition demanding skill and cleverness to recognize its cause, as well as ingenuity and ability to afford permanent relief. The necessity of frequent voiding not only prevents the unfortunate sufferer from attending to her ordinary duties or from enjoying the usual social pleasures, but constantly harasses and disturbs her at night, making sleep an impossibility and life a misery. The usual routine examinations are often not sufficient to establish clearly a diagnosis which will enable us to treat an evident lesion.

If pus be found in the urine of such a patient, a comparatively simple problem is presented: that of finding its source and eliminating it. Technical difficulties may be encountered, but as a rule the cause of trouble can be found with certainty without very great hardship. Making the diagnosis involves cystoscopy with or without ureteral catheterization, *x*-ray examinations, etc. The bladder is examined; if this is not at fault the ueters are catheterized, and usually pus may be found coming from one kidney or the other. Calculus, pyelitis, tuberculous kidney, or an infected kidney are among the usual causes of pyuria in the upper urinary tract.

When, however, we have to deal with the patient, usually a woman, suffering with frequent micturition without pus in the urine and without cystitis or tumor, we find often that skill and patience are taxed to the limit.

Neisserian or other latent urethral or periurethral infections must, of course, be excluded. Often too much stress is placed upon slight abnormalities detected about the external meatus. One must bear in mind the possibility of a tuberculous kidney even though there be little pus in the urine. Here smears and guinea-pig injections help to put us on solid ground. Cultures are often helpful and should be made routinely.

[1]Read before the Peninsular Medical Society.

Pyuria with a sterile culture, of course, suggests t. b. kidney.

On examining the bladder, while the ordinary ulcer is easily discovered, remember that a careful search may be necessary to detect the so-called "elusive" ulcer of Hunner. This begins with an infiltration of the bladder wall, showing up only secondarily or slightly on the mucous membrane. At intervals it is barely to be seen. It is usually found at the vertex of the bladder; it may often be detected by the presence of a congested leash of veins; it is not curable by ordinary measures, and commonly requires operative excision.

Testing the acidity of the urine was once thought to be valuable and important. It was believed that hyperacidity often irritated the bladder just as hyperacidity of the stomach was thought to give rise to symptoms of that organ. To a minor extent this is probably so; we almost never, however, find the severe long-standing cases of urinary frequency dependent merely on a hyperacidity.

Urinary acidity may be determined easily by titrating with one-tenth normal NaOH solution, using phenolphthalein as an indicator, after first precipitating calcium with an excess of potassium oxalate.

The concentration of the urine is often held responsible, but it also rarely causes serious long-standing trouble. Taking the specific gravity or estimating the urea content, by either Marshall's urea method or by the use of sodium hypobromite, gives us a good idea of the concentration. In the Howard A. Kelly Hospital, with which I am connected, these determinations have helped us but little.

In going over the cases treated in the clinic showing urinary frequency in which no apparent cause could be discovered, and in which symptomatic or other treatment was given, it occurred to me to try to find out what the end results had been after a period of two to fifteen years. While volumes have been written on the distressing condition here discussed, I could find no definite statements on which I could base a prognosis whether such conditions would spontaneously clear up in the course of years or whether they would persist indefinitely, and this seemed worth determining. Quite a large number of cases could not be traced. Of those that were traced sixteen replied satisfactorily, seven are entirely well, two state that they are permanently improved by the treatment given them; the remainder say that, though years have elapsed and though they have undergone treatment at other places, their symptoms are unimproved.

The usual treatment for such cases, after they have been carefully investigated, consists of urethral dilatation up to a size twelve Hegar sound, with local applications to the trigonum and the urethra of silver nitrate solution two to five per cent. This may be followed up by instillations, given by the family physician, along with constitutional treatment, which usually comprises keeping the patient at rest in bed, giving an excess of water, potassium citrate, tincture of hyoscyamus, a bland diet, etc. We have not tried the method recently suggested of injecting quinine and urea beneath the trigonal mucosa, fearing infection and sloughing. We await further reports of its use.

We recognize the fact that frequency of voiding may be a mild transitory phenomenon. It is commonly seen after labor, particularly if the labor is a difficult one, or may result from exposure or some other cause. These mild cases are generally self-curative. They often are relieved immediately by a single, thorough dilatation of the urethra. Simple dilatation of the urethra, before mentioned, often gives temporary relief from long-standing frequency, probably by overcoming spasm of the cut-off muscle, no matter what the cause may be of the irritability. I have for example lately seen a patient, with a long-standing bladder ulcer which caused her to void ten or more times at night, almost completely relieved of her distress for one week by the dilatation incidental to the introduction of a cystoscope. I have seen two or three cases of long-standing, very distressing bladder irritability entirely

relieved by a single application of five-per-cent solution of silver nitrate to the apparently normal trigonum. Unfortunately, these results are far from being the rule.

The fact that so many of these cases go on indefinitely, the sufferer dragging out a distressing, painful existence, should stimulate us to making every possible effort to determine the cause and cure of the trouble. Stone or stricture of the ureter in the pelvic portion especially may be the obscure lesion for which we are searching. Among our cases of ureteral calculus it is surprising to find two in which the stone was almost bulging into the bladder without at any time causing frequency of voiding. Quite characteristically the patient with a ureteral stone is found to complain of distressing frequency associated with acute attacks of colic, but often disappearing entirely during the intervals of comfort. Of course if a secondary true cystitis develops as the result of secondary infection, a constant frequency is to be expected.

Long-standing cases of pyelitis, in which we have organisms and pus constantly thrown into the bladder from above, often astonish us by failing to redden the vesical mucosa. However, these very cases, in which the mucous membrane of the bladder looks normal, not infrequently suffer with frequency. For example, of ten patients with pyelitis taken at random from a series, I find that two only showed a typical cystitis, while seven suffered with frequency. Here obviously the indication is to treat the pyelitis medically or surgically, allowing the bladder to take care of itself. Needless to say, local treatments of the bladder might be carried on indefinitely without permanent benefit to the patient.

Hunner has of late insisted in numerous articles on the important rôle played by distant focal infection in the production of bladder lesions and symptoms. The majority of the patients included in this study were gone over before this was fully appreciated, so that unfortunately no discussion of the point is here possible. One brilliant case comes to my mind in which a patient was admitted to Dr. Alfred Stengel's ward in one of the hospitals in Philadelphia, apparently dying of a parenchymatous nephritis. Removal of infected tonsils worked a miracle, the nephritis rapidly subsiding. In the same way bladder ulcers which have been treated for a long time are sometimes cleared up by the elimination of focal infections of the teeth, sinuses, tonsils, or cervix.

Cervical infection may, of course, be cleared up by local applications of silver, more often by linear cauterization, frequently by cervical repair or amputation. In 1913 Leonard sounded a note of warning in regard to the too free use of cervical amputation. In going over the cases treated at the Johns Hopkins gynecological department he found a surprising number of secondary hemorrhages following amputation. According to Leonard also only nineteen per cent of women otherwise fertile become pregnant after an amputation of the cervix has been performed, and of these not more than one-half go through their pregnancy without interruption. Finally, of the ten per cent remaining, who go to term, labor is very often long and difficult. For these reasons, while admitting the necessity of clearing up cervicitis which is apparently causing frequent voiding, I would urge the more conservative measures rather than amputation, in young women especially.

Hunner has also paid a great deal of attention to ureteral stricture, usually, according to him, a result of focal infection, as a prominent cause of vesical irritability. Of fourteen cases of evident ureteral stricture presenting themselves in this clinic between January 1919 and October 1920, all complained of pain in back, pelvis, or flank. Of these three complained of troublesome, constant frequency of voiding. Two others stated that frequency was only annoying during the acute exacerbations of pain, reminding us of the usual experience in stone cases. Seven of these patients have never been troubled with bladder symptoms; one of them had severe trouble of this sort for a short time only. It seemed likely to me that the long-standing cases of stricture with quantities of pus in the urine would

prove to be the ones in which bladder irritability would be excessive. Such was, however, not the case. Of our fourteen cases only two showed great quantities of pus, and one of these had no trouble with her bladder. The fact that two of the stricture cases showed frequency without pyuria illustrates the importance of looking for ureteral stricture as a possible cause of vesical irritability. It should be noted that the stricture cases above mentioned were nearly all of them obvious ones obstructing the introduction of the catheter.

In all bladder cases a careful pelvic examination is, of course, a *sine qua non*. If we have been unable to find any obvious pathological condition in going over the kidneys, ureters, and bladder, it is often a great temptation to consider any abnormality of the pelvic structures that may be discovered responsible for the distress. Only too often has the operative correction of some minor fault of the pelvic structures proved useless and discredited the optimistic surgeon as well as discouraging the already despairing patient. Many a woman has been told that a retroverted or anteflexed uterus was responsible for her misery, only to be disappointed by the failure of an operation for its correction to relieve her. A displaced uterus *per se* rarely causes a very troublesome urinary frequency. A cystocele associated with prolapsus may mechanically cause dysuria and may eventually be responsible for a true cystitis. As a rule, however, bladder irritation in such a condition is not a conspicuous symptom, and the sufferer only mentions it incidentally or on questioning the fact that she voids more often than in bygone days. She does, of course, often complain of a considerable difficulty in emptying the bladder.

In these cases of prolapsus a thorough operation must be performed to give relief. Simple suspension of the uterus and repair of the outlet are never satisfactory. Simple amputation of the uterus is positively harmful.

If the examiner finds a uterine fibroid, he should not ordinarily expect to relieve his patient by its removal. Large fibroids frequently pull the bladder high above the pubes and may cause difficult voiding instead of irritation. Small fibroids never cause bladder distress. If a large fibroid chokes the pelvis and makes great pressure on the bladder, one may expect its removal to relieve the patient of urinary frequency. A few years ago it was not unusual to have bladder irritability follow hysterectomies for fibroid. This was due to rough handling of the bladder in separating it from the uterus. If ordinary precautions are taken, it is almost never now seen.

Acute pelvic inflammatory disease or even an acute appendicitis, when that organ lies next to the bladder, may cause urinary frequency and should be treated surgically.

Cancer of the cervix may by direct extension invade the bladder and cause pain and frequent urination without giving rise to any symptoms directly referable to the uterus. In such a case the author once saw through the cystoscope a distorted bladder with a normal mucous membrane; the urine contained no abnormal elements. The correct diagnosis was not made until a rigid, fixed carcinomatous cervix was found, the disease being wide-spread and involving the bladder wall. There had been no vaginal bleeding or complaint other than a very trying frequency of urination of rather sudden onset.

CONCLUSION.

In the preparation of this paper no attempt has been made to mention all the possible causes of frequency of urination in the absence of cystitis. I wish to emphasize: (1) the very important fact that well-developed cases usually continue for many years and do not often recover spontaneously unless their cause is recognized and satisfactorily treated; (2) to protest against the performance of operations for the correction of unimportant pelvic lesions which are not responsible for the bladder irritability.

Note.—My thanks are due to Dr. H. A. Kelly for his kindness in allowing me to use numbers of his case reports along with my own in preparing this paper.

The Reduction of Temperature in Children Without the Aid of Drugs[1]

BY H. BROOKER MILLS, M.D., F.A.C.P.

Professor of Pediatrics, Medical Department, Temple University; Pediatrist to the Samaritan and Garretson Hospitals, and Consulting Pediatrist to the Hebrew Sheltering Home and Day Nursery

Fever in children is truly a symptom-complex. Most frequently it is an exhibition of vasomotor unrest, and it may be, therefore, psychic or physical. In young children, under one year, the emotional element plays a most important rôle. The undeveloped cortex does not inhibit. All acute diseases in young children are therefore ushered in with more or less fever; this is always the leading clinical feature. The symptoms of acute disease, which in an adult are often restricted chiefly to the organ or region primarily involved, tend in children to affect the patient as a whole. Thus we find that diseases develop general or constitutional symptoms more frequently and on less provocation than in adults; the younger the child, the more striking is the contrast, and in all of them localizing symptoms are less obvious. The clinical symptom-complex that goes by the name of cerebral state, and comprises blurring of the mental faculties, drowsiness, delirium, and coma, though not rare at any age, is induced most readily in the young. These signs are therefore of less importance in early life. Acute pneumonia, whether beginning with convulsions or not, may set up this cerebral state quite early in its course, and before any localizing signs have developed in the lungs. In adults, on the other hand, such a condition does not, as a rule, arise until the disease is passing toward a fatal issue. If we were to state the attitude of children to acute disease, feverishness being the main feature, we would say that their equilibrium is shifting. They are easily overthrown, but are as easily set up again. Their center of gravity is high in health and they are soon knocked down.

The treatment of the sick with a minimum amount of medication in the shape of drugs is, perhaps, one of the most prominent and important evidences of the progress of medicine in the past decade, and in no branch of the science of medicine is this more apparent than in the treatment of diseases of children. There are so many drugs that their little systems cannot tolerate in a dose of a size that would have any therapeutic value, and there are so few vehicles that do not have the drawback of either annihilating the value of the drug or nauseating the patient by their syrupy taste, that the treatment of the diseases of childhood with a minimum amount of drug medication is no longer a matter of choice, but is really one of necessity. All acute diseases are accompanied by more or less fever, and this is especially marked in the early years of life.

The most satisfactory antipyretic for young children is water, but this also has its limitations. It may be used in the form of an ice-cap, hot-water bag, sponge or colonic irrigation, but must be used cautiously. By these means we are able to calm down a nervous irritability, and this is done by literally bleeding the children into their own vessels. The routine method that we follow in private, as well as in hospital practice, in managing the feverish child, is first the manipulation of the ice-cap and hot-water bag. The ice-cap is placed to the head and the hot-water bag to the feet when the temperature reaches 100° F. by rectum (and I may add rectal temperature is the only reliable temperature in children in our opinion, and then only when the thermometer is inserted the same distance every

[1]Read before the Associated Physicians of Hazelton, at Hazelton, Pa., November 14, 1921.

time it is taken). Of course this has the effect of equalizing the circulation in the most satisfactory way, and is preliminary to the sponging. The ice-cap is kept on for an hour, and then removed for an hour, and so on throughout the day from 7 A.M. to 7 P.M., as children do not bear very well the too long continued application of cold, but the hot-water bag is kept continually at the feet when the temperature is 100° F. or above by rectum, and even when below if the feet are cold.

If the temperature continues to rise, and four hours later has reached 102° F., then we supplement the ice-cap and hot-water bag with tepid sponging. This is accomplished by removing all of the clothing, except the diaper, and placing the child on a blanket and sponging for ten, fifteen, or twenty minutes, which will allay the nervous tension as well as reduce the temperature, and is more satisfactory than any anodyne, especially if done in a gentle manner by a person with a soft touch. In a fretful or nervous child it is well to use what we call the three-basin method, in which we commence with water at the temperature of 90° F. and sponge the body very carefully, commencing at the face and gradually going down the anatomy until the whole body has been covered, and then allow a little evaporation, or have the child exposed, except its extremities. The second step is to use water at a temperature of 80° F. and proceed in the same way as the first, finally using a basin containing water at 70° F. This method of procedure is less trying to the child and favorable results are earlier reached. If the child is irritable or excitable, the whole body should be bathed in instalments until it has been covered in full. This method has usually been found to be worth all of two degrees reduction in temperature. Children will submit to this procedure very gracefully, unless the manner of application is forced. The exposure may ofttimes be avoided by a wet compress on the chest or abdomen, or, where the child dislikes wet applications, it is found well to have, in addition to the ice-cap and hot-water bag already mentioned, an ice-cap on the chest or abdomen, the abdomen usually being more satisfactory than the chest.

If, in spite of the use of the ice-cap and hot-water bag, and the sponging, the temperature continues to rise and four hours later has reached 104° F., then, in addition to continuing the use of the ice-cap and hot-water bag, we substitute for the sponging the use of colonic irrigations, sometimes called entreoclyses, at others high enema.

This has been recognized for years as one of the most valuable methods in the treatment of disease, in adults as well as in children, and various methods of administration have been, and still are, employed. Among other indications for the use of this therapeutic measure, in addition to the reduction of temperature, might be mentioned the relief of constipation, the elimination of gas, the quieting of the nervous system, the increase of renal activity, and the administration of nourishment and drugs. The apparatus needed consists of a container for the fluid, held not more than eighteen to twenty-four inches above the level of the patient, to which is attached a rubber hose, at the end of which is a glass or hard-rubber tip, and a soft-rubber rectal tube or catheter.

It is our custom to first pass the well-oiled rectal tube or catheter into the rectum about two inches, the child lying on its back or left side on a Kelly pad on the bed, or on the mother's or nurse's lap. The tube is held in this position for a few seconds to allow of the escape of gas, as it has been found that the pain frequently complained of during a colonic irrigation is entirely avoided if the gas is first gotten rid of. It is equally important to rid the tube attached to the container of all air by letting a few drops of fluid pass through. The free end of the rectal tube or catheter is now slipped over the glass or hard-rubber tip so that continuous connection exists between the child and the solution to be used, and the catch is then gradually released so that the fluid begins to flow slowly into the colon,

the insertion of the rectal tube or catheter being at the same time gradually increased, often in the past to a distance of eight or ten inches or more.

The fluid used is either normal salt or two to five-per-cent soda bicarbonate solution; the temperature is about 100° F., which may be gradually reduced if desired, and the quantity employed is rarely less than two quarts, and much more if it is not returning clear. The rectal tube or catheter has two holes at the end to be inserted in the rectum, one at the tip and the other at the side about one-half inch from the tip, so that should one become plugged with mucus or fecal matter the solution would pass freely through the other. When the colon is fully distended contraction takes place, which expels much of the contents, as shown by the squirting of the returning solution alongside the tube, so that there need be no fear of too much fluid being used. Massage of the abdomen when the colon is distended with fluid is often beneficial. Urination practically always occurs during the giving of a colonic irrigation, and it is not surprising, therefore, that a child usually goes to sleep immediately after, if not during the treatment, in view of the comfort resulting from the elimination of gas, mucus and feces from the bowel and the passing of urine from the bladder, to say nothing of the reduction in temperature.

On all occasions, when giving colonic irrigations with barium for *x*-ray studies, it was found that, when more than four or five inches of tube were inserted, it coiled on itself in the rectum, the end of the tube turning and coming back to the anus, and although apparently this did not interfere at all with the passage of the solution, as it was shown to have traversed the full length of the colon in spite of the coils, the occurrence of this coiling naturally suggested the question of the advisability and necessity of passing so much of the tube into the colon. Although no harm is done, even in typhoid fever, as the Peyer's patches are situated higher up in a child than in the adult, nor is the efficacy of the irrigation in any way diminished, we naturally seriously considered advising that the tube be passed only so far and so long as it remains straight, which would probably be from four to six inches, although this would be a variable factor. In view of the fact that the practice of passing so many inches of the tube into the bowel is universally employed and recommended in all text-books on pediatrics, some recommending that the catheter should be inserted its entire length, and also in view of the fact that every one making use of this form of treatment reports such universally good results, it does not seem that any necessity exists for the modification of the technique; at the same time, particularly in inexperienced hands, such as when a physician advises a mother to give a colonic irrigation, it might be well, now that we know what happens when many inches of the tube are inserted, to direct that the insertion should not be more than from two to four inches, as we have not observed a single case where the tube passed around the sigmoid flexure, as it was formerly supposed to do, when any more than that was inserted.

The above is true in both adults and children. On account of the greater relative length and redundancy of the infantile sigmoid, it seems even more improbable that the tube passes this flexure. We have experienced no difficulty in filling the entire colon with but four inches of the rectal tube inserted, and the patients experience less discomfort than they do when a greater length is used.

While there is no particular harm from passing ten or twelve inches of tube, it is unnecessary, and there is always the chance that the tube will buckle, shut off the lumen, and obstruct the flow.

The former teaching that the flow of the solution, after inserting the tip of the tube, would balloon out the gut and allow the tube to pass around the sigmoid is incorrect.

We do not claim any originality in this matter, as we know a paper was published some years ago on this subject by Dr. Henry T. Machell of the University of

Toronto, but we bring the matter to your attention at this time for two reasons: (1) To remind you of the great value of colonic irrigations as a therapeutic measure; and (2) to suggest that the method might, in the future, be somewhat modified, at least to the extent of inserting the tube a shorter distance into the colon, and watching the result in order to determine, as we are endeavoring to do, whether or not just as good results are obtained.

I might add that our temperatures are always taken at 7 and 11 A.M., and at 3 and 7 P.M., but never during the night, nor do we give nourishment or treatment of any kind during the night, except in emergency, as we feel the best nocturnal antipyretic is quiet, restful sleep. We also take the temperature thirty minutes after every sponge and colonic to note the effect produced.

Another valuable adjunct in the management of feverish children, and one now being strongly advocated throughout the medical world, is that of permitting the entrance of plenty of fresh, cold air into the sick-room (but not too cold), regardless of the temperature of the patient, the only precaution necessary being the avoidance of draughts, which may readily be accomplished by the intelligent use of screens.

Of course, the question of packs, hot and cold, in the treatment of high temperature, is entirely familiar to you all, but personally I make but little use of them in the case of children.

In a number of cases of extremely high temperature that resisted all attempts at reduction, I have resorted to the use of lumbar puncture, even though there was no special indication for its use, and have been surprised at the excellent results obtained.

Finally, the care of sick children, especially if running a high temperature, should include treatment in the open air. They should be placed outdoors in hammocks or beds, if at all possible, several hours every nice day, regardless of the disease from which they may be suffering, or the age or condition of the child. We have found that by having the little sick ones protected by the proper clothing and placed where the sun's rays do not strike them, many beneficial results are obtained from a few hours in the fresh air, not only so far as their disease is concerned, but also in their general health. The use of the ice-cap and hot-water bag is continued while outdoors, but of course they are taken inside for their sponges and colonics.

One great advantage of the foregoing methods, outside of their effect on the temperature, which by the way will stay reduced much longer than if accomplished with drugs, and without the accompanying depression, is the production of many hours of quiet, restful sleep, the sick child in nearly every case going into a good sound sleep after its sponge and its irrigation and during its stay in the open air. Another important advantage is that the stomach is saved for its natural purpose, nourishment, and we have proved to our satisfaction many times that if the stomach be used for this purpose only, and not upset by the use of drugs, much more nourishment will be taken by the child in twenty-four hours, and just as much stronger will it be at the end of its acute illness, and in proportion just so much shorter will be its convalescence.

Preliminary Report on Mercurosal

BY EVERETTE ERWIN BUTLER, A.M., M.D.
Associate in Medicine, Louisville, Ky.

[From the Solomon Clinic]

In the treatment of syphilis, whether it be in the primary, secondary, or tertiary stage, some form of mercury should be administered. Salvarsan or neosalvarsan will usually quickly eradicate all signs and

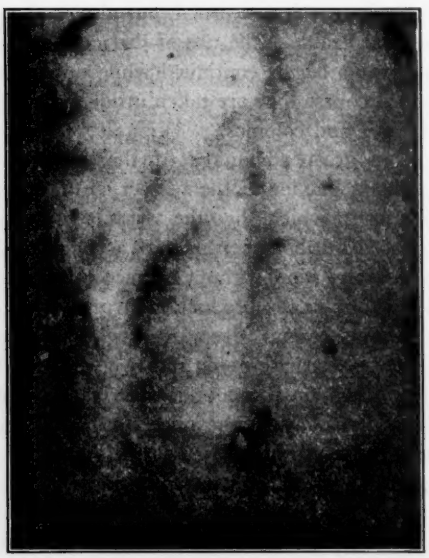

FIG. 1.

symptoms of this disease, but it is a well-known fact that without mercury and iodides in conjunction with salvarsan, a cure is not effected. How frequently though do we come in contact with a patient, who has had the required number of salvarsan injections, without the equally important course of mercury injections. Is it because the physician does not wish to administer this form of treatment, or because the patient dislikes to have same administered? Of course it is the latter, and the reason is that the employment of mercury, as usually administered, is unpleasant to the patient.

Of all routes by which mercury may be introduced, the most preferable as well as the best mode of administering the drug is by injection, either intramuscularly or intravenously. With one of the most frequently used preparations for intramuscular injection, and, I might add, one of the most efficacious, namely, mercury salicylate, the patient complains of more or less soreness at the site of the injection for many days afterward. I have heard the statement made several times by widely experienced physicians that "the administration of mercury salicylate intramuscularly drives patients away," and this I have noted to be

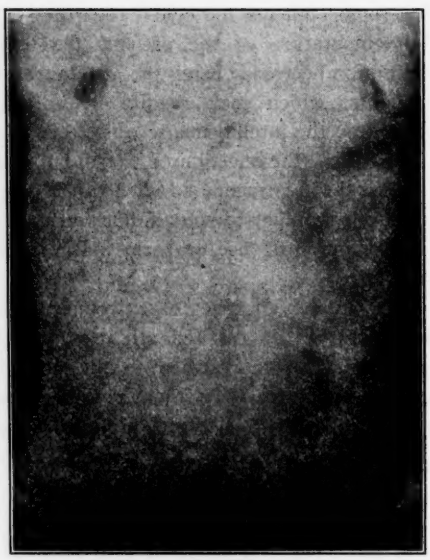

FIG. 2.

frequently true. For this reason, in the clinic, we decided to try to find an efficacious preparation which, when administered, would produce very slight, if any, after-effects.

Through the courtesy of the Department of Experimental Medicine of Parke, Davis & Company we were furnished with a supply of mercurosal, one of their experimental products. Mercurosal, according to their report, is a new synthetic preparation, chemically disodium mercuri-salicyl-acetate, containing about 40 per cent mercury by weight. We have used this product for some two and one-half years, injections being administered, intramuscularly or intravenously, as often as three times per week. The usual additional treatment at weekly intervals of a course of six to eight

FIG. 3.

intravenous salvarsans or neosalvarsan was employed. Wassermann tests were made at the beginning of the treatment, occasionally while patient was under treatment, and at various intervals after treatment was discontinued.

STUDY OF MERCUROSAL.

1. Mercurosal is readily soluble in distilled water, .05 gram to 2 cc, or .1 gram to 5 cc.

2. When administered intramuscularly it produces very slight, if any, pain at the site of the injection.

3. When administered intravenously in the proper dosage and proper dilution, or even double that amount, no local or systemic reaction follows. No irritation or blocking of veins occurs, and the same vein may be used repeatedly for administration.

4. Mercurialism is not at all likely when careful observation is kept of patient. None of our patients showed any signs of mercurialism, even though we gave the maximum dose at frequent intervals.

5. Mercurosal apparently yields the same therapeutic result as other active mercury preparations.

DISCUSSION.

We are well pleased with mercurosal, though we find it cannot be used quite as conveniently as other mercury preparations in that the powder has to be dissolved in sterile, distilled water immediately before its administration. Sterile distilled water must be continually kept on hand. Patients seem to prefer the intravenous administration to the intramuscular, but this requires more frequent injections, as the mercury is probably eliminated more quickly after this mode of injection than when administered intramuscularly. No tests were undertaken to establish the average elimination time of mercurosal after intravenous administration.

The following cases are selected to show the number of injections, dosage, and effect of mercurosal and the kind of additional treatment administered:

Case 1.—R. J. B., white, male, aged 17; clerk at drug store. Came to the clinic 8/12/'19, with sore on penis, of ten days' duration. Examination revealed beneath foreskin a small sore with slightly indurated edges. Inguinal glands bilaterally enlarged in chain formation. Sore was diagnosed as chancre, but dark-field illumination failed to show the treponema pallida. Wassermann was negative.

Observation 8/15/'19. Condition showed no change.

Observation 8/22/'19. Condition showed no change. Wassermann test negative.

Observation 8/29/'19. Condition showed no change. No evidence of secondary rash.

Dark-field illumination for treponema pallida, negative.

Patient left the city on a vacation, and we did not see him again until September 11, 1919, at which time a papular eruption was present over body (Fig. 1), throat was

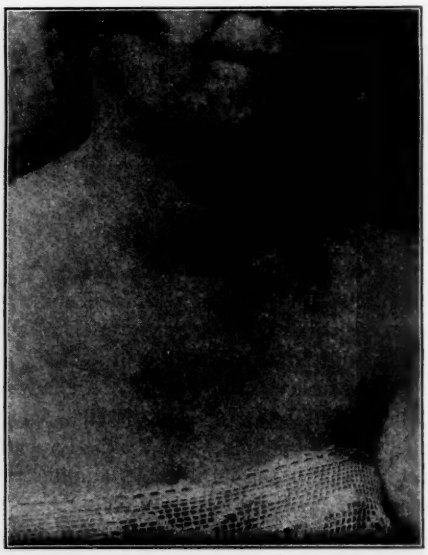

FIG. 4.

sore, and a few mucous patches were found in the mouth. Wassermann test was positive four plus. Outline of treatment: Neosalvarsan, daily injections for three doses, then once per week for six weeks, beginning with 0.3 gram and gradually increasing to 0.9 gram. During this time mercurosal was administered both intramuscularly and intravenously, two or three times per week.

September 21, 1919. The secondary eruption has disappeared (Fig. 2). After a period of one month's rest a Wassermann test was positive two plus. Neosalvarsan was again administered at weekly intervals for three weeks and mercurosal intravenously three times per week for two months.

After discontinuing treatment another month the Wassermann test was negative. Further treatment, during the next one and one-half years, consisted of an occasional injection of neosalvarsan, followed by a course of twenty-four injections of mercurosal intravenously. Clinical results were good, and the Wassermann test has remained negative. October 8, 1921. Wassermann test still negative.

Case 2.—K. M., female, white, aged 27, unmarried, waitress. Presented herself 8/30/'19 at the clinic with a typical secondary maculopapular squamous rash over the body, chiefly on the anterior portion of the thorax, forearms, and face (see Fig. 3). A history was obtained of a sore on external genitalia, six weeks previously. On examination, patient was found to have a sore throat and mucous patches in mouth. Patient had been living with a bartender, who she stated left town about a month before the initial sore appeared. Wassermann test positive four plus. Treatment was immediately begun, using the same method of treatment as outlined in the previous case.

9/8/'19. Secondary eruption on face almost gone (see Fig. 4).

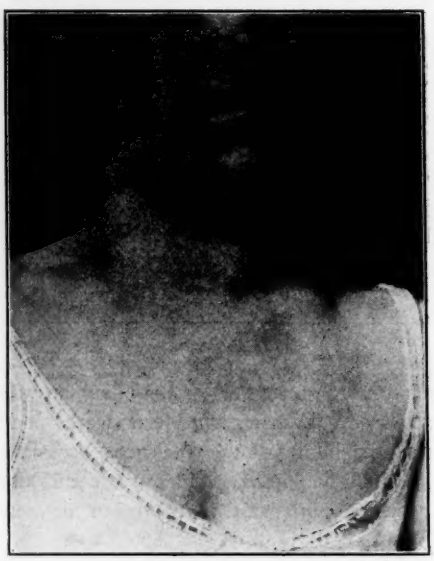

FIG. 5.

9/13/'19. Eruption has entirely disappeared (see Fig. 5).

9/15/'19. Wassermann three plus.

11/17/'19. Wassermann one plus.

Clinical results were good, and Wassermann test became negative 1/16/'21.

REPUBLIC BUILDING.

The Study of a Massive Dose, Seventy-five Grains, of Luminal

BY J. B. McNERTHNEY, M.D., F.A.C.S.
Tacoma, Washington

The toxicity of luminal is comparatively unknown, so observations relative to the effects of this drug, that has certainly taken first place in exerting a favorable influence on epilepsy, by reducing the number and the severity of attacks, may be omitted.

Mrs. S., aged thirty-six years; mother of five children, from two to twelve years of age.

Family history: Parents both living and well, aged seventy and seventy-six years. No history of epilepsy. Two brothers in perfect health. No history of childbirth injury.

Began menstruation at fourteen years, regular and normal. Married at twenty-four years; gave birth to her first child one year later.

Two months after birth of second child, some three years from date of marriage, she had her first epileptic seizure. Soon her second child developed convulsive seizures, has continued as an epileptic, and is now in the State Hospital for the Feeble-minded. Her other children are in perfect health; occasionally there would be a period of four to six days without an epileptic attack.

Chief complaint: The patient came complaining of one to three epileptic attacks daily, and making the request that her womb be removed, as she was told by a doctor that this would relieve her spells. She is well developed and nourished; weight 156 pounds. No marks of skull injury, slight thyroid enlargement, heart and lungs normal. Abdomen is flaccid, and there is a small umbilical hernia.

Reflexes not disturbed. Blood-pressure 130-80; pulse 80; respiration 24.

Wassermann, two plus. No history of specific treatment.

She was assured that hysterectomy would be useless, as far as preventing the convulsive attacks, but was told of a new drug that in a certain percentage of cases gave relief. That evening, with her next approaching aura, and doubtless in an insane moment, she swallowed the entire contents of the box, seventy-five grains of luminal. According to bystanders, in ten minutes she became drowsy, with continuous yawning. It was three-quarters of an hour after taking the drug that the writer saw her in a deep, quiet sleep, pupils slightly contracted and sluggish to light.

She was given apomorphine 1/10 gr. hypodermically, repeated in ten minutes, without producing vomiting. Her stomach was washed, and she was immediately sent to St. Joeseph's Hospital, where the gastric lavage was repeated.

We know luminal is readily dissolved in organic solvents, so that doubtless she had absorbed the drug before she had the gastric lavage.

She remained in the profound sleep for eighty hours, then gradually assumed her usual state of mind.

During all this time her respiration and pulse seemed slightly changed from normal. Considering the amount of liquids that she took during this period, the secretion kept up to normal ratio—in fact, the saliva seemed to be increased.

Examination of the blood at various times showed little change from the normal.

It is now eight months since taking this massive dose of luminal, and there is no appearance of the attacks.

Epilepsy is the most disheartening of all conditions, and a drug that even causes the arrest or eliminates the convulsions, that feature of the disease that prevents these patients from blending with society, and incapacitates them from earning a livelihood, is indeed most valuable.

It would seem, with the introduction of luminal, that there is little doubt that this preparation produces the safest sleep, without injury to respiration or circulation, and that in time it will find a wider range of application especially in toxic goitre, in which the writer has used it with excellent results many times without the least evidence of circulatory or respiratory disturbances.

The Treatment of Visceral Syphilis[1]

BY THOMAS McCRAE, M.D.
Professor of Medicine and Clinical Medicine in the Jefferson Medical College of Philadelphia

In discussing the treatment of any condition it is well to consider carefully what we hope to do, what it is possible to do, how we can do it, and in how far the disease can be influenced. In the treatment of visceral syphilis it is evident that there are two parts to the problem. In the first place we have a chronic spirochetal infection, contracted some time before and usually a considerable time before, which has become chronic in the strongest sense of the word. Secondly, we have the changes which have resulted in the tissues as a result of this infection. When we treat visceral syphilis what should we have in view—to try to correct both conditions, or to devote our efforts to one more than the other? Naturally the ideal is to correct both if this is in our power. We can suppose that it may be possible to remedy one and not the other. Take, for example, syphilis of the lung. It may be that the spirochetal infection can be terminated and yet extensive tissue changes remain. True, these represent in some part the process of healing and to this extent are to be desired, yet we do not have a result with complete restoration to normal. It is even possible, for example in the liver, that this may be a result serious in itself. Let us discuss these points separately.

1. *The possibility of freeing the body from the Treponema pallidum.* With our present knowledge it is not possible to speak with any certainty as to the proportion of cases in which this is done. It is to be remembered that visceral syphilis only is under consideration. There are cases in which, so far as the evidence goes, it is done. There are others in which it has not been done. When we consider the work of Warthin, in which he found such a large proportion of bodies harboring spirochetes, we must be very cautious in claiming too much therapeutically. In this connection the distinction must be kept clearly in mind between an infection with *Treponema pallidum* and the clinical manifestations of the disease syphilis. A man may harbor the spirochetes and yet be in perfect health without any clinical signs of syphilis. There seems no reason to suppose that serological tests are always necessarily positive when the tissues contain spirochetes, for the organisms may lie quietly, neither troubling nor being troubled by the tissues of the host. Years later, for some reason, the spirochetes may be stirred into activity and clinical syphilis become evident.

It does not seem possible to be certain, in any given case, that we can kill out the spirochetal infection. All signs may be negative, but the spirochetes are there. A comparison may be made with an anthrax infected field on which generations of cattle may pasture without the appearance of a case of anthrax, when suddenly, for some reason, the infection becomes active and the disease appears.

It is probable that various tissues react differently in this regard. With syphilitic infection of the aorta very few of us feel, I am sure, that we can have any certainty of having killed all the organisms. We may influence the process in the tissues for the

[1]Read before the General Meeting of the Medical Society of the State of Pennsylvania, Philadelphia Session, October 5, 1921.

better, but that is all, and the disease is likely to advance sooner or later if it is once established. In the aorta it is difficult to say how much this is due to the *Treponema pallidum* and how much to the changes in the vessel itself. In the liver we have a contrary state of affairs. A syphilitic process there shows little tendency to recur if it is once energetically treated. In all cases the time element is important. Even in the aorta, with early recognition and prompt treatment, much immediate benefit may result, but the end results are not very satisfactory.

The matter may be summed up by saying that in treating visceral syphilis we hope to kill out the infection, but it is wiser to regard it as being latent and not absent. Certainly this is the safest attitude for the welfare of the patient.

2. *The changes in the tissues.* Here we are on much more solid ground and have greater certainty of what therapy can do. Naturally much depends on the extent of the changes present when treatment is begun, but in general (excluding changes in the central nervous system) we can feel that it is in our power to aid materially in the majority of cases and to have a satisfactory functional result in many cases. How much of this is due to the action of drugs which destroy the spirochetes (arsphenamine and mercury) and how much to the drug which influences the changes in the tissues (iodide) is difficult to say. It is possible that what happens differs in various organs. In the liver, for example, there is no question that in some cases we can cause disappearance of the symptoms by the use of iodide alone. There are few more remarkable demonstrations in therapy than the influence of iodide on the fever of hepatic syphilis. Within forty-eight hours, as a rule, the fever has disappeared. The enlarged liver decreases in size, the jaundice disappears, and ascitic fluid is absorbed, all by the administration of iodide alone. Exactly the same result may be obtained in the case of gummata elsewhere. The most plausible explanation is that the iodide saturates the unsaturated fatty acid radicals which inhibit autolysis. The ferments then become active, autolysis follows, and the necrotic tissue is absorbed. We may say that in so far as the tissue changes are concerned, the use of iodide is the most important factor. It is well to remember, however, that this does not mean any influence on the spirochetal infection.

In considering the treatment of visceral syphilis, the important influence of disease of the arteries should be remembered. Syphilis is particularly a vascular disease, and this plays a large part in the visceral lesions, illustrated best, perhaps, in the nervous system. The specific treatment has little or no influence on the vascular changes, a point to be kept in mind in considering the possibilities of therapy.

Indications for Treatment.—Naturally one says diagnosis, but this may be a very difficult matter about which to be certain, and a good rule is to play safe when in doubt and treat actively. This brings up the question of the Wassermann reaction and how much we can depend on it as an indication for beginning treatment and as an aid in the decision as to the duration of treatment. One may quote the apt remark that this reaction "is a piece of evidence and not a verdict." A striking example was seen during the past year in a patient with marked signs of syphilis of the liver. He had not received any specific treatment because his Wassermann reaction was negative. The harm which may result from making a fetish of this reaction could not be better demonstrated. In this connection it is worthy of note that in some cases of hepatic syphilis with ascites, the Wassermann reaction is negative in the blood and positive in the ascitic fluid. Certainly in cases of visceral syphilis it is a sad mistake to demand a positive reaction as a preliminary to treatment. A negative Wassermann reaction should have no influence whatever if there are clinical signs or even justified suspicion.

A more difficult problem arises when we ask how far the Wassermann reaction should be regarded as an indication for the duration of treatment. My own feeling is

that it should occupy a subordinate place and not be considered too seriously. When we consider the work of Strickler, in which individuals who had not had syphilis, so far as could be determined, were given arsphenamine and subsequently gave a positive Wassermann or luetin reaction, it is natural that the question should be asked as to how often this phenomenon may result from arsenic medication. No one can answer the question, but we should all do some hard thinking about it. The reaction may be negative with well-marked signs of syphilis. Another point is the great variation in the reaction which may be shown from time to time. But to my mind a far more important argument for treatment without too much attention to the Wassermann reaction is the fact that in every case we are dealing with a chronic infection which we can never be certain has been terminated. In other words, the infected individual should be treated for the rest of his life at intervals, no matter how well he may seem to be and no matter what his serum reaction shows. If we adopt this rule and can persuade our patients to be guided by it, much can be accomplished.

To come to the question of actual treatment, as regards the possibility of killing the spirochetes, nothing is gained by any argument as to the relative value of the arsenic preparations and mercury. Both have some drawbacks and dangers, and in my judgment if there were a choice of only one of them, it would be mercury. (This applies to visceral syphilis only.) But as our knowledge is to-day, both should be given. As is true in the use of arsphenamine, neoarsphenamine, etc., in other forms of syphilis there is difference of opinion as to dosage. In visceral syphilis there seems little room for controversy; the dose should always be small to begin with and increased gradually, if at all. One reason is that in all cases of visceral syphilis there is a strong chance of the aorta being involved, and it is well recognized that in these cases there is definite danger from the use of the arsenic preparations. This does not mean that many patients cannot take large doses safely, but there is always a risk. In one form of visceral syphilis—syphilis of the liver—the use of the arsenic preparations is contraindicated. The danger of a severe reaction, resulting hepatic damage and perhaps death is considerable. In the past year or so, for some reason, there have been an unusual number of patients showing evidence of hepatic injury after the administration of arsphenamine or neoarsphenamine. The reason is not evident, but it emphasizes the danger of the use of arsenic in hepatic syphilis in which mercury and iodide are so satisfactory.

On the other hand, the use of mercury demands a thorough study of the condition of the kidneys before its use is begun (although the danger of renal damage does not seem to be great) and a careful watch over the condition of the blood. There may be a rapidly increasing anemia if mercury is given carelessly—a point worthy of some emphasis.

The actual treatment may be begun by giving arsphenamine or neoarsphenamine (except in hepatic syphilis). In general it is well to give comparatively small doses, say 0.2 gm. arsphenamine or a corresponding relative amount of neoarsphenamine. The dose may be repeated weekly for four or six weeks. It is better to give arsphenamine first and mercury later. If the condition is serious it may be advisable to give a larger amount of arsphenamine after the first dose, but it is wise to increase the amount gradually. If there is any question as to the possibility of danger from arsphenamine, mercury should be begun at once, otherwise after the course of arsenic injections. In hepatic syphilis mercury should be given. As regards the choice of the preparation of mercury, my preference is strongly for administration by inunction. A course of 20 to 30 inunctions should be given, six a week. The results seem to be more rapid and certain than by injection. In some cases we are surer of the drug being given regularly if injections are used, and this is an important point in careless patients. As to the administration by mouth, this should not be employed in the

early stages of treatment, but after mercury has been given thoroughly by inunction or injection this may be employed with advantage.

As to the amount of treatment to be given, it is well to give a course of arsphenamine or neoarsphenamine injections, followed by a series of mercurial inunctions. After an interval of two weeks both should be repeated. Following this a period of three months may elapse before both are repeated. In the interval, mercury may be given by mouth. The mercury and chalk powder in doses of one or two grains three times a day is an excellent form, or the bichloride with iodide or the proto-iodide.

As to the administration of iodide, this may be begun at once and continued steadily for some time. If there is any question as to the duration of administration it is well to continue it. The dose must be adjusted to the patient. As a rule moderate doses are usually sufficient and need not go above 30 or 40 grains a day. In hepatic syphilis it seems that the smaller amounts are best, and 30 grains a day are usually sufficient. But the problem should be settled for each patient. We would all agree that in syphilis of the nervous system massive doses are advisable. Iodide should be given steadily, or with very short intervals when it is discontinued, for a period of four to six months, and after this for at least one month in three. It should not be forgotten that some patients who have difficulty in taking small doses are perfectly comfortable if the dose is considerably increased. Another point is the wisdom of giving the drug well diluted in water or milk.

How long should treatment be continued? If we hold the view that the "cure" of visceral syphilis, in the sense that the spirochetal infection is completely killed, is uncertain and difficult of proof, then it seems wise to repeat the treatment perhaps twice a year or at least once a year for the remainder of the patient's life. In any case this should be carried out once a year for five years. We know how difficult it is to have this done.

As to other measures, they must be employed when occasion demands. One point is worthy of note—attention to the condition of the blood. This should be watched and proper treatment carried out for anemia. It is well recognized that in some patients the administration of antiluetic treatment results in a rapid improvement in anemia if present, but this should not be taken for granted.

CONCLUSION.

1. That the "cure" of the spirochetal infection in visceral syphilis is to be hoped for but is uncertain.

2. That asphenamine and neoarsphenamine should be given in small dosage, especially with aortic disease, and not at all in hepatic syphilis.

3. That the use of mercury should be regarded as an important aid in visceral syphilis.

4. That treatment should be given as intensively as possible and repeated if possible once a year for five years, better once a year for the duration of the patient's life.

5. That our attitude toward the Wassermann reaction, whether positive or negative, as a guide to treatment should be a conservative one.

Swiss Health Resorts for Tuberculosis.

In the *Lancet* of September 10, 1921, Cox states that in regard to treatment at the Swiss sanatoriums, one is struck by the amount of individual supervision of patients. Each patient is usually seen by the doctor twice daily, and, of course, oftener if he is seriously ill. The hours of rest and the amount and times of exercise are all laid down for strict observance. All of this is implied in the general term "Kur." It is perhaps an unfortunate word, since it suggests that very different thing, the anatomical cure of the disease. When we hear of a patient coming for the "cure" several years in succession, it sounds like a contradiction in terms. May it not be the lack of

this constant and careful supervision in some of the English institutions which has brought the whole system of sanatorium treatment into some disrepute among us of late? Genuine sanatorium treatment in the average case is nothing more or less than an unremitting attention to every detail of the patient's life, an attempt to eliminate as far as possible every adverse influence retarding recovery, and promote every favorable influence assisting it. This is not an art to be acquired in a few months.

In Switzerland much more importance seems to be attached to rest than to exercise, and the method of graduated labor does not appear to be in vogue. Walking is generally regarded as the best form of exercise. There is sometimes a difficulty in restraining the more energetic patients from taking too much part in winter sports, most of which are obviously unsuited. For the ambulant patients, about five hours' rest daily, lying on long chairs on the balconies, seems to be the rule. Rest before meals is insisted on; rest immediately after meals is not encouraged, and it is thought better at those times to take a little walk. From two to four each afternoon is in many places kept as a time of complete rest, with no talking, reading, or any occupation whatever. Patients on admission are kept for about a week in bed, and if the pulse and temperature are satisfactory, are then allowed to begin getting up. The method used in some American sanatoriums of keeping even afebrile patients in bed for six to eight weeks does not seem to be practiced.

Heliotherapy is everywhere condemned for pulmonary cases, except for certain chronic pleurisies, which it relieves. In the ordinary pulmonary case it is said to cause "congestion" and to provoke hemoptysis. This apparently is not the experience in some of the Scandinavian sanatoriums: one author there states that the incidence of hemoptysis in his institution has strikingly diminished since actinotherapy was started. In surgical tuberculosis, heliotherapy is, of course, extensively used with excellent results, when properly applied. No more than a drug like digitalis can sunlight, whether real or artificial, be used in treatment with success if employed indiscriminately and without proper regard to dosage and idiosyncrasy. Bernhard, of St. Moritz, a pioneer in the scientific application of sun treatment, has summarized his experience in a recent article in *Tubercle* (August, 1921).

Of the more specialized forms of treatment, artificial pneumothorax is everywhere in considerable use, and probably applied in a wider range of cases than is at present customary in England. At one sanatorium Cox was told that some 12 per cent of cases are found suitable for this treatment. As a main indication, assuming a unilateral lesion, definite evidence of breaking-down or cavitation of lung tissue, shown, for instance, by the presence of elastic fibers in the sputum, was suggested to him. Patients in whom a pneumothorax is already established should go to the mountains just before a refill is due, so that the change in atmospheric pressure is not harmful; similarly, one returning to the lowlands should be refilled to a highe pressure than usual before leaving.

The complications of artificial pneumothorax and those cases in which a pneumothorax cannot be produced owing to adhesions are more thoroughly treated by surgery than is generally possible at present in England. Various types of thoracoplastic operation, and the filling of cavities otherwise impossible to close, by paraffin wax or by transplants of fat, seem to be the operations mainly performed. Cox did not hear of any special operations for the division of adhesions. Most of the sanatoriums have now their own operating theaters, and practically all their own *x*-ray plants.

Tuberculin seems to be now used in a somewhat attenuated manner, and rather in those cases "which are strictly localized, and when the patient is 'sticking' and not getting on," to use the phrase of Hudson of the Palace Hotel Sanatorium at Montana, than as a routine.

Editorial

TRANSFUSION IN CHILDREN.

As the readers of the THERAPEUTIC GAZETTE know, the literature concerning the transfusion of blood has advanced by leaps and bounds during the last decade, the great war very materially increasing the number of those who have employed transfusion with more or less success. Further, the recognition of the fact that certain types of blood are incompatible with other types has done more than anything else to place transfusion among the list of remedial measures which can be resorted to with comparatively little danger to a patient who is in a desperate condition.

From time to time our readers have found in the pages of the GAZETTE information regarding the use of normal saline, of gum acacia solution, of blood serum, of citrated blood, and of pure blood injected by various methods in the hands of numerous investigators, and it will be recalled that these studies have covered the use of such injections not only in cases of acute hemorrhage, such as is met with in general surgery or as a result of industrial injuries, but that these injections have been employed to combat both primary and secondary anemia arising from other causes. Information also has not been lacking in regard to transfusion of blood through the longitudinal sinus in children in whom the fontanelle has not yet closed.

Possibly the most exhaustive report on blood transfusion in children, however, is that of Robertson, Brown and Simpson in *Northwest Medicine*, taking their records from the wards and laboratories of the Hospital for Sick Children in Toronto.

After first pointing out the great importance of preliminary grouping tests before transfusion is performed, and also emphasizing the value of cross-agglutination tests, they proceed to describe the experience which they have had, adding this interesting statement: that when the emergency precludes the grouping tests and the patient would die if not transfused, it is permissible to use a non-grouped donor if the physiologic test is employed. In other words, a preliminary intravenous injection of 20 to 30 cc of the donor's blood is given, and during the next five minutes the patient is watched to discover if any evil symptoms are developing. They think that if no signs of incompatibility arise one may proceed with a fair degree of safety, and they point out that the signs of incompatibility are pulse disturbances, alteration in respiration, lumbar pain, dilatation of the pupils, pallor about the mouth, flushing of the face, and sometimes sudden urticaria. Although it has been generally considered that those individuals whose blood is represented by group four may be considered as universal donors, nevertheless they believe that it is much better to use the blood of the same type as that of the patient if it can possibly be obtained.

Concerning the best method of intravenous injection of blood, they believe that the syringe-cannula method of Lindeman is in general terms most applicable, and when they resort to it they use six 20-cc ground-glass syringes lubricated with liquid paraffin. They add that the attaching of a two-inch pure gum rubber tube to the hub of each cannula is, in their opinion, a useful addition, since it greatly simplifies the withdrawal or injection of blood, presumably because it permits of some movement on the part of the operator holding the syringe without disturbing the cannula in the vein of either the donor or the donee.

Another important point which they emphasize is the use of the exposed internal saphenous vein over the internal malleolus. The advantages of this vein are: It is fairly constant in position and larger than the elbow veins, which in young children are apt to be deeply buried in fat. It can be readily exposed by an incision across its course if necessary. It possesses the addi-

tional advantage that the point of injection is far removed from the vital centers, and therefore the injected blood has a fair opportunity to get well mixed with the patient's own blood before it gets to the heart. Furthermore there is no danger of damage to a vital part if the patient moves, as there is when the longitudinal sinus is employed.

The amount of blood to be given should, in their opinion, not exceed 16 cc per pound of weight of the child below two years of age, and the proportion for older children is smaller rather than greater. A gauge as to the quantity of injection is the return of a healthy pink to the skin of the face, but if the veins of the neck become distended the transfusion should be stopped, and it should never be continued until cyanosis is present. Needless to say, the injection should be given slowly whichever method is employed. The limit that they name is 100 cc in three minutes.

It is interesting to note in this connection that these observers discuss with care the problem of exsanguination transfusion; that is to say, a procedure when there is present profound intoxication whereby the patient's blood is removed in considerable quantity and supplanted by that of the donor. Manifestly this proposition possesses certain elements of danger if the patient is already exceedingly weak, and in an infant not more than 80 to 100 cc should be withdrawn before transfusion of fresh blood is started. In this connection they strongly advocate that the operator have adrenalin on hand for intravenous injection should any signs of collapse occur during the exsanguination. If the pulse fails, 3 to 8 minims of adrenalin 1:1000 should be given intravenously, and this is best accomplished by pushing the needle of the hypodermic syringe into the rubber tubing to which we have referred so that the injection of the blood and the adrenalin occur simultaneously. The immediate effect of the adrenalin is to produce sudden blanching of the face, followed by a few coughs, and almost instant improvement in the pulse.

It will be recalled that this exsanguination transfusion method has been tried by some clinicians not only in the toxemias of childhood, but in the toxemia of nephritis. Exactly what its future status will be is as yet undecided.

A point of very great interest in connection with the contribution made by these clinicians is not only the large number of patients which they have had—namely, 600—but the various conditions which they have treated by transfusion. We have not room to give in detail a large part of their paper. In that condition commonly called marasmus, and which now is sometimes called decomposition, they transfused 87 cases with a mortality of 45 per cent, which high mortality is chiefly due to the fact that 20 per cent of the patients were in collapse and at the average age of five months weighed only seven pounds. It is interesting to note, however, that of the collapsed cases 43 per cent made a complete recovery, whereas in another statistical series without transfusion the mortality was 57 per cent, and of the moribund cases 82 per cent. In acute intestinal disturbances they also obtained excellent results in a total of 108 cases, although their mortality was 59 per cent, but it is to be borne in mind that the patients were all seriously ill or moribund.

They state that the most striking results as to recovery occurred in those children who were profoundly toxic, there being a marked improvement in severe cases of infectious diarrhea. They also found blood transfusion useful in cases of pyloric stenosis and in hemorrhagic disease of the new-born. In the latter condition the number of cases was 43, with a mortality of 2.3 per cent and no recurrences. In secondary anemias they treated 63 cases with a mortality of 9 per cent, the causes of death being acute respiratory infections and acute intestinal upsets. The causes of these secondary anemias were chiefly rickets and malnutrition from prolonged breast feeding. In splenic anemia and von Jacksche's anemia they also got results which lead them to believe that the method

should be resorted to, but in leukemia, of which they had five cases, there were four deaths; the fifth case they were unable to follow, so that their mortality was probably 100 per cent.

Passing from these various conditions of disease, they report their results in traumatic and postoperative shock, as, for example, in that found after the operation for intussusception and in the toxic shock due to superficial burns. In 29 cases of pyemia and septicemia they only had eight recoveries, nevertheless they believe that the method is to be followed as it may produce good results.

In concluding their paper, which is illustrated by a number of interesting charts, they once more emphasize the possibility of using a small amount of blood as a preliminary test when typing cannot be carried out, and also express their very profound belief that in toxemia, and in shock from superficial burns in which convulsions have occurred as a result of the toxemia, and in which cases death with any other form of treatment rises to the proportion of 100 per cent, transfusion offers great chances for relief. This view seems to be supported by the fact that out of eight cases they had five recoveries, and two of the three that died succumbed to a bronchopneumonia after the toxemia had been relieved.

Studies of this nature based upon a very large number of cases are not only of extraordinary interest, but of great clinical value. We shall look forward with interest to further investigations by these clinicians and by others who may see fit to follow in their footsteps.

BETTER CONCEPTIONS OF RENAL DISEASE.

In Leading Articles in comparatively recent issues of the THERAPEUTIC GAZETTE, and in the papers recently contributed by Patterson and Jones to its pages, evidence has been presented to our readers that the older methods of studying and controlling cases of renal disease are far more inadequate than has heretofore been thought. Medical literature during the last few years has fairly teemed with contributions along these lines, and the papers to which we have just referred contain not only a record of the observations made by these writers, but a fair statement of the present aspect of this important matter.

We discuss the subject again at this time because a single paragraph at the close of an article contributed to the *Archives of Internal Medicine* by Williams may be utilized as a text even although it seems to be iconoclastic, if considered in connection with our earlier conception of renal disease. This sentence reads as follows: "The presence of albumin and casts in the urine is not necessarily diagnostic of nephritis, nor is their absence necessarily indicative of the non-existence of such disease." This assertion emphasizes the point, even if it seems too sweeping in its character, that no physician can obtain a satisfactory grasp of the condition of his patient if he does not utilize the newer methods which have been devised to determine renal efficiency, and we use the word "methods" advisedly rather than method, since we think it is becoming more and more clear that single measures cannot be used as substitutes for old ones, but that groups of measures must be employed. The so-called phthalein test, for example, is undoubtedly of very great value, but he who relies upon it as the sole agent to determine renal efficiency will in a certain proportion of cases be disappointed.

The two-hour estimation of specific gravity should also be resorted to, as should also the quantity and the specific gravity of night urine as compared with day urine. Last, but not least, these urinary examinations should be compared in many instances, if not in all, by competent studies of the blood content in respect to non-protein nitrogen. By this means a better conception of the ability of the kidney to do its work can be reached than if the examina-

tions are confined solely to fluid excreted. In other words, it would seem more important to determine variations from the normal in the blood stream than to determine variations from the normal in the urine, for it would also appear that the content of non-protein nitrogen in the blood, whether it be normal or abnormal, is more constant than are the ingredients of the urine which depend in quantity, not only from day to day, but from hour to hour, upon the functional activity of the kidney.

One of the difficulties in dealing with renal cases at the present time is that it is almost impossible, unless they are gravely ill, to make them understand the importance of instituting these newer methods of procedure. To tell them that the old methods have proved utterly inadequate may serve to diminish their confidence in what the medical man can accomplish, but in the majority of instances if the patient is intelligent and willing to coöperate with the physician, a careful statement of the necessities of his particular case will bring about collaboration.

As we have pointed out on previous occasions, the arbitrary institution of a salt-free diet when there is no proof that the kidneys are incompetent to eliminate salt is unjustifiable. So, too, is the rigid exclusion of protein food when a blood analysis repeatedly shows that there is no material increase in the non-protein nitrogen of the blood.

Last of all, we may add to the somewhat sweeping paragraph already quoted, this additional one: That the estimation of the specific gravity of a single sample of urine presents little evidence by which we can judge of the functional activity of the kidneys, because one of the best evidences of normal renal function is variation in specific gravity from hour to hour and from day to day, and he who has a fixed specific gravity, whether it be high or whether it be low, cannot be considered as normal as he who has one which varies constantly within proper limits.

THE INTRASPINAL INJECTION OF A STIMULANT IN URGENT CASES.

It will be recalled that several decades ago Corning of New York first suggested and carried out the injection of cocaine intraspinally with the object of producing surgical anesthesia in the lower portion of the body. As with many other inventions, his observations did not receive adequate attention, and a number of years passed before intraspinal anesthesia became at all popular. It then had considerable vogue, but at present would seem to have passed into the list of those things which can be done in certain well-selected cases but which ought not to be commonly resorted to. Then we had the period, which still exists and exists worthily, of spinal puncture for diagnostic purposes and also for the purpose of exercising a direct beneficial influence. This in turn was followed by the method of treating cerebrospinal syphilis by the introduction of salvarsanized serum or mercurialized serum, both of which measures seem at the present time to be somewhat on the decline.

It is interesting in this connection to note that some French clinicians are now advocating the employment of camphor and caffeine intraspinally when the patient's life seems to be in danger from shock or collapse arising as the result of an injury, surgical procedure, or in the course of acute diseases. Thus Bloch and Hertz have suggested that when evil symptoms develop as the result of intraspinal injection of anesthetic substances, an excellent practice is the use of from two to four grains of caffeine in solution after some of the spinal fluid containing the local anesthetic is withdrawn, and claim that under these circumstances the evil symptoms which are present are rapidly dissipated.

It will be recalled, too, that as far back as 1918 LeGrande advocated in cases of fracture of the skull with associated shock the injection of camphorated oil by the intraspinal method, claiming that the results

were excellent and that he had not in any case observed disagreeable consequences.

In a recent issue of *La Presse Médicale*, it is pointed out that Sabrazes and Pauzat have injected intraspinally camphorated oil in desperate cases of scarlatinal nephritis.

When camphorated oil is used, those who have employed it in this manner perform spinal puncture at the point of election and evacuate spinal fluid to the amount of camphorated oil which is to be injected, usually 10 cc, the patient of course maintaining the dorsal cubital position. If, on performing spinal puncture, the cerebrospinal fluid is found to be hypotensive, the injection is made without such preliminary withdrawal.

Again, we find that Bloch, Camus and Hertz have recently reported their experiments upon the intraspinal injection of caffeine for the dissipation of evil symptoms after novocaine and cocaine have been employed, claiming that by this means cases in which death seemed threatened were saved by virtue of the stimulating effect of this drug upon the respiratory center and by overcoming circulatory collapse.

We have mentioned these methods of employing stimulants in urgent cases rather as a matter of interest than because we are prepared to advocate them. There are many things of which it may be said that they can be done but oftentimes they ought not to be done.

So far as we know there are few or no experiments in existence which would indicate that absorption of these stimulants, and the production of their physiological effects, can be produced more rapidly by this method of administration than by the intramuscular or intravenous method. When a local anesthetic is given intraspinally and produces evidences of grave disturbance, it may prove to be wise to administer stimulants by the same route, although the question arises as to whether their employment in this manner might not, perchance, increase the rapidity of absorption of the depressant drug which still remained in the cerebrospinal fluid.

It would appear that a series of experiments upon animals might well be made before this somewhat novel and radical procedure is commonly resorted to, although in cases which seem absolutely hopeless the lead of the French clinicians might well be taken up as a last resort. Should any of our readers follow their plans, we trust that they will let us have their results.

EXTERNAL MEASURES IN THE TREATMENT OF PAROXYSMAL TACHYCARDIA.

The exact meaning of the term paroxysmal tachycardia is to some extent still uncertain, in the sense that it describes a state the underlying factors of which are not clearly understood. As a rule the term is applied to sharp attacks of exceedingly rapid heart action, somewhere in the neighborhood of 230 beats per minute, which condition of rapidity is not constant, but, as the term indicates, comes on in paroxysms. It may be or may not be associated with symptoms in other portions of the body, and, physiologically speaking, its cause would appear to be some sudden failure on the part of the inhibitory nerves of the heart, the result being the equivalent to that seen in the physiological laboratory when the function of these nerves is destroyed by section. In other cases of more moderate tachycardia, appearing for brief intervals and often causing the patient a good deal of alarm, associated with a sense of faintness, the condition is not dependent so much upon loss of function on the part of the pneumogastrics as it is upon inadequacy of the vasomotor center and its subsidiary, with the result that the blood-pressure being suddenly lowered, the heart beats rapidly because the *vis a fronte* is suddenly removed, as, for example, rapid heart action that occurs, in part at least, as the result of the action of nitrite of amyl.

In some cases of paroxysmal tachycardia, even if the symptoms are severe they persist for so short a time that it is practically impossible to give any medicine for relief.

By the time the medicine is prepared the attack is over, or even if the medicine is administered, before it can be absorbed recovery has taken place.

It has been known for a number of years to both physiologists and clinicians that, in some cases at least, pressure over the pneumogastric nerves, or, what is practically the same thing, pressure over the carotid arteries, will oftentimes materially influence the cardiac rate. In some of these cases of paroxysmal tachycardia such pressure seems to give immediate relief, and this is the more important to remember because after the physician has made such pressure and produced good results, he can instruct the patient to apply the pressure himself as soon as the attack is threatened. In other instances it has been found that pressure upon the eyeballs will exercise a somewhat similar influence, and in still others deep breathing has served to arrest the attacks.

Attention to this matter is once more called by a communication to a recent number of *Heart*, in which Wilson records the case of a man of thirty-eight who suffered from attacks of paroxysmal tachycardia in which the rate was as high as 250 per minute, a count which was confirmed by the electrocardiograph. The systolic pressure was only 94 and the diastolic 86. There were no physical signs in the lungs, and the heart sounds, as one would naturally suppose with this low pressure, were diminished in degree but no murmurs were heard. The case was also characterized by acute cardiac dilatation, a condition which has been seen in many other cases of paroxysmal tachycardia by the aid of the *x*-ray.

As Wilson well points out, pressure over the vagi sometimes fails to give any relief, the paroxysm defying all treatment of this kind. Some unknown cerebral lesion must have been responsible for the attacks in this particular patient, because aphasia, hemiplegia, and gangrene of one arm took place, and later epileptiform convulsions developed, which Wilson thinks were probably due to cerebral changes caused by previous paroxysms.

Nevertheless, Wilson in his concluding remarks makes this important statement, namely, that after the patient has been taught to control his attacks by vagus stimulation—that is, direct pressure over the carotids, ocular pressure, and deep breathing—they cease to be a menace.

GONORRHEAL RHEUMATISM.

Involvement of the joints secondary to a gonococcal infection of the mucosa rarely occurs before the third week of the disease, and in its acute form is expressed either in the form of a synovitis; which causes pain, swelling, and limitation of motion, is usually transitory, disappearing under simple rest treatment; or as an arthritis and periarthritis causing boggy induration of all the structures about the joint, abolishing function and giving rise to crippling and constant pain. Nor has this latter form a tendency to disappear rapidly and completely, but rather to persist for weeks and months, producing, because of the intense suffering it causes, a profound effect upon the patient's general health, resulting all too often in complete loss of function of the joint. Those who have once suffered from arthritis, under a recurrent attack of gonorrhea from a lighting up of the latent infection, are prone to experience the same trouble again. The chronic gonococcal infections, particularly those in the posterior urethra and seminal vesicles, produce a different type of arthritis characterized by both overgrowth and destruction which may last and progress for years, and produce, if untreated, permanent disability. These joint inflammations are metastatic expressions of focal infection. Similar chronic conditions arise from tonsils, teeth, sinuses, appendix, and gall-bladder.

Perhaps the most illuminating contribution on the subject of cure of the chronic cases was that of Fuller, who showed and apparently proved by clinical demonstration that by abolition of the infection the joint process could not only be stopped, but by

rational means the joint could be restored. It has been generally accepted that whether the condition be acute or chronic the first step in treatment lay in the ablation of the focal infection, nor can there be serious doubt cast upon the validity of this view. That it has not always proven itself true clinically is incident to the fact that the removal of one focus is not adequate when several such exist. For instance, given a chronic prostatitis in addition to a seminal vesiculitis the drainage or ablation of the seminal vesicle will not necessarily cure an arthritis due in reality in part or whole to the prostatic condition.

Concerning the acute and subacute cases, some of which incident to mixed infection suppurate, there has been some diversity of opinion as to treatment. Heat, light, counter-irritation, incision, vaccines, immobilization, free motion, all have had their vogue and all have given some successes, since the disease independent of the treatment of the gonococcal infection has a natural tendency toward subsidence, though this may take a long period. In the presence of suppuration there can be no question as to the advisability of operation, and in the absence of suppuration, particularly in the cases characterized by marked periarticular infiltration, with marked joint and bone involvement, the procedure is worse than useless. All who have had experience in these cases note the beneficial effects resulting from rest as secured by proper splinting, but against this treatment there have been earnest protests on the part of those who believe that if the joint be fixed its function is necessarily impaired and often permanently. This is a view which must be based on theory rather than upon practice. In this relation Collings's (*International Journal of Surgery*, October, 1921) report is of particular interest and value.

Collings notes that in the last seven years there were admitted to the Urological Service in the Bellevue Hospital 517 cases suffering from gonorrheal rheumatism. For about two years, from August, 1919, to May, 1921, 26 cases of the 517 were treated with heavy plaster-of-Paris casts.

Constant and intense pain and loss of function of the affected joint is the chief complaint.

Diagnosis is based on the occurrence of an arthritis in the course of a gonorrhea. All cases had intracellular diplococci in the urethral smear. All foci of infection were eliminated before immobilization was started, to wit, teeth, tonsils, and nasal sinuses.

Radiograms of the joint involved, Wassermann and complement fixation for gonorrhea, were done as a routine procedure. In none of the cases treated by casts did ankylosis result, nor was an arthrotomy for suppuration performed. These encouraging results are attributed to the heavy casts that immobilize the joint above and below the one involved, all bony prominences being especially well padded with cotton wadding.

The cast was removed at the end of two weeks and the patient given an alcohol rub and passive motion. A new cast was immediately applied for another two-weeks period. The cast was again removed and the limb baked and massaged for about thirty minutes every day. The tenth day thereafter the patient walked on the joint.

Regarding the duration of cast treatment: one-third of the patients were discharged in 18 to 36 days; one-third of patients were discharged in 36 to 60 days; one-third of patients were discharged in 60 to 81 days.

Various vaccines, serums, drugs, and operations on the seminal vesicles have proven inefficacious in the general treatment of these cases.

SURGICAL ELEPHANTIASIS FOLLOWING BREAST OPERATIONS.

One of the complications attendant upon the radical operation for removal of a growth of the breast which has been most distressing to the patient, and for which there seemed to be no preventive measure to be taken, or curative means to be adopted, is that slow swelling which often reaches enormous dimensions; best characterized by

the term surgical elephantiasis. The underlying cause of this has been assigned to a complete lymphatic block incident to a dissection in the axilla so radical that practically all the channels for lymph return are cut. As to the inadequacy of this theory from the standpoint of explaining this result, it lies in the experience of every surgeon that this complication does not necessarily follow a most complete and comprehensive dissection, and may result from one much less complete.

It is on this subject that Halsted (*Bulletin of the Johns Hopkins Hospital,* October, 1921) contributes an article advancing the belief that this swelling is in many cases not due to the cutting of lymph channels, but rather is incident to a low-grade inflammatory block. Whilst still under the impression that the swelling was an incident of the section of the lymph channels, Halsted modified his operation. He observed that by abandoning the incision down the arm and tacking the skin edge at the upper margin of the wound with fine silk sutures to the first intercostal muscle and its fascia in such manner as to raise the axillary fornix to the highest desirable point, he eliminated the tug on any part of the skin or scar.

No effort was made to approximate the cut edges of the skin at the upper third or perhaps upper half of the denuded area; on the contrary, the flaps were pressed away from the wound's center—the outer flap upward and outward, the inner flap upward and inward—and stitched to the underlying muscles of the thoracic wall. Thus there was secured for the infraclavicular and axillary regions a superabundance of skin, and entire freedom of arm movements in all directions was assured. Furthermore, by the tacking of the margin of the flap close up to and sometimes even under the subclavian vessels, there could be no dead space below the clavicle such as results in plastic operations from the attempt to approximate the margins of the flap—the dead space whose arc, formed by clavicle, first intercostal muscle, and first rib, is subtended by the more or less tightly drawn tegmen. The lower half or more of the denuded area was to a limited extent covered by gently drawing the free margin of the skin toward the center of the wound and tacking it to the underlying muscles, although the size of the grafted area is of little practical consequence to the patient, and only slightly more time is consumed in covering with the large grafts a greater than a less surface.

More was accomplished by this new method than had been anticipated, for not only was the normal range of arm movements secured, but there resulted other benefits unforeseen. Swollen arms of huge dimensions were no longer observed, marginal necroses rarely occurred, and the grafts took throughout with few exceptions.

It is within the experience of every surgeon, especially of those who employ plastic methods to cover the defect, that frequently marginal necroses of the flaps occur and occasionally sloughings of considerable dimensions, and that it is usually in these cases that the swelling of the arm is most pronounced. Attendant upon the necrosis there is infection, and inflammatory reaction in varying degree, and the greater the reaction the greater in general the swelling of the arm, immediate and ultimate.

There are cases in which months or even years after the operation on the breast the arm becomes swollen from a cause other than the recurrence of the carcinoma.

Recurrent carcinoma being excluded, may not the later swelling of the arm have the same cause, whatever that may be, as that which appears soon after the operation? What is the cause? What is the explanation of the fact that after the radical operation, the world over, for cancer of the breast the arm so frequently swells and sometimes to such degree that amputation has been proposed and indeed made for relief?

Why is it, furthermore, that a modification in our method of closure of the wound, the operative details otherwise being essentially unchanged, should so strikingly affect the result as regards the swelling of the arm?

It is not from observations made in the

Johns Hopkins clinic alone, but from the testimony of surgeons and radiologists elsewhere, that it seems fair to conclude that swelling of the arm follows the plastic operations in greater proportion and in more pronounced form than is seen in the cases treated by skin-grafting. And, moreover, in the skin-grafting operations, which the author traces back to 1895, conspicuously swollen arms became almost a thing of the past after the method of pressing back the flaps at the upper part of the wound and stitching their edges to the underlying intercostal muscles was adopted.

Something must therefore have been superimposed upon the mere clearing out of the axilla in the ordinary as well as in the extraordinary plastic operations, and in the operations at the Johns Hopkins Hospital which antedated the author's modified procedure, to account for the so frequent swelling of the arm.

In addition to the evidence furnished by clinical experience there is the testimony of the many who have studied the causes of elephantiasis filariosa that blocking of the lymphatic glands and vessels is not of itself sufficient to account for the edema, at least in its pronounced forms.

Dr. F. L. Reichert, who with the assistance of Dr. C. Y. Bidgood has made for Dr. Halsted in the Hunterian laboratory, during the past winter, experiments bearing on this subject, has thus far been unable to produce edema in the legs of dogs by the mere severing of veins and lymphatics. In this research all the tissues of the thigh were severed except the femoral artery and vein, the main nerve trunks, and the bone; then the divided parts were carefully reunited by stitching. For seven or eight days there would be slight swelling of the legs below the line of suture. On subsidence of this temporary swelling the femoral vein (the only undivided vein) would be ligated. No demonstrable increase in the size of the leg occurred after this ligation. Thus in one week or less the lymphatico-venous circulation was reëstablished through the line of suture—through the scar.

May the swelling of the arm after the radical operation for cancer of the breast be prevented? The study of cases operated upon by the newer method has brought out the fact that excision of the axillary and supraclavicular glands plus resection of the subclavian veins is rarely followed by noticeable swelling of the arm. On the other hand, it cannot be denied that obstruction of these lymphatics and venous channels might conceivably alone, without infection, suffice occasionally to produce a moderate amount of edema. But it is assuredly impossible to assert in any case that infection has played no part in the causation of the swollen arm.

It is unnecessary to stress further the importance of discarding operative methods which clearly predispose to infection, quite aside from the fact that these methods—the plastic ones—tend to deter the surgeon from sacrificing a sufficient amount of skin, or, if perchance enough skin has been excised, to increase the danger of swelling and of restricting the range of movement of the arm. In the plastic operations the wide dissections of the skin extending sometimes to the spinal column, over and under the opposite breast and down to the iliac crest, may conceivably sever lymphatics which might aid in the restoration of the lymphatic circulation. The performer of plastic operations presumably asks himself whether skin enough to make possible the use of his favorite method can be preserved; whereas the advocate of skin-grafting who understands its possibilities may sacrifice, without concern about the closure of the wound, as much skin as seems to him desirable. It is unfortunate that surgeons should permit themselves to be placed in the predicament of choosing either to incur greater danger of recurrence or to imperil the success of a plastic method.

The most common cause of the late postoperative swelling is, of course, the recurrence of the disease, a recurrence which blocks new channels. But swelling in its most aggravated form is seen with the recurrences accompanied by inflammation—it may be only the reactive inflammation

incident to the rapidly growing neoplasm. Now the question naturally presents itself as to whether the reactive inflammation in some of these recurrent cases may not be partly of bacterial origin, an inflammation superimposed upon the tissues engorged from lymphatic and frequently also from venous obstruction.

Progress in Therapeutics

Medical Therapeutics

Treatment of Acute Poliomyelitis with Immune Horse Serum.

In the *Journal of the American Medical Association* of August 20, 1921, ROSENOW states that a comparison of the results obtained with immune horse serum with those obtained with serum from convalescent persons is indicated, since Amoss in a recent paper infers that the latter is the only serum treatment available. In Rosenow's reports on the results obtained at Davenport, it was shown that the mortality and incidence of paralysis in patients treated in the preparalytic stage were less than was reported from the use of serum from convalescent persons. There were no deaths, as is shown in his table, and only one patient developed slight paralysis, which disappeared completely, in a group of sixty patients treated in the paralytic stage, and no deaths and only one patient with slight residual paralysis in a group of sixty-one patients treated after paralysis had begun, but which was slight at the time of treatment. Thus, of a total of 121 patients treated in the early stages, none died, and only one showed slight residual paralysis.

In contrast are the results reported from the use of the serum from convalescent persons in the preparalytic stage of the disease. Ten of fifty-four patients treated by Zingher developed paralysis; six of fourteen treated by Amoss and Chesney developed paralysis, and two died; sixteen of fifty-one in Peabody's series developed paralysis, and five died. Thus, of a total of 119 patients treated in the preparalytic stage, 26.8 per cent developed paralysis, and 5.8 per cent died.

It should be stated that nearly all physicians who had opportunity to observe the effects of the immune horse serum became convinced that it possesses definite and often striking power to prevent paralysis, that it is of definite benefit if given within from thirty-six to forty-eight hours after the onset of paralysis, and that if given after that it is of less value.

The epidemics studied were severe. The mortality rate and incidence of residual paralysis in the untreated patients were high. The patients treated lived in widely separated communities.

There was no difference in the severity of the early symptoms in the patients untreated and in the different groups in the patients treated. The average age was somewhat higher in Group 3, patients with advanced paralysis, but on the whole it corresponded accurately to the usual age incidence in this disease. The various types of the disease were quite equally divided among the groups. The incidence of contact infection approximated the average in other series of cases. The average cell count in the spinal fluid and the average amount of serum given were about the same in the various groups.

The good effects noted at the bedside following the injection of the serum were in general proportional to the earliness of the injection. They were often striking, occurred after repeated injections, and were

independent of the withdrawal of spinal fluid. When improvement occurred, it was with such regularity and in such marked degree in the early cases as to exclude accidental occurrence and to indicate that the absence of deaths, the low incidence of paralysis, and almost total absence of residual paralysis in Groups 1 and 2 were due to the early administration of the serum.

The results in the collective investigation corroborate in detail those which Rosenow obtained in both epidemics and in the sporadic cases in which the primary data were obtained at first hand.

Rosenow concludes that his immune horse serum, prepared by repeated injections of increasing doses of freshly isolated strains of the pleomorphic streptococcus, has curative power in poliomyelitis, especially when given in the early stage of the disease, is warranted, that its general use in the treatment of this dread disease is indicated, and the need for early diagnosis in suspicious cases by spinal puncture is again emphasized.

Kaolin in the Treatment of Asiatic Cholera.

WALKER, in the *Lancet* of August 6, 1921, states that treatment has been directed to meet all conditions which occur. Potassium permanganate, opium, saline injections, subcutaneously and intravenously, hypertonic solutions of saline (Rogers) have been used with considerable effect. It was, however, during the Balkan epidemic at the close of the Balkan war, 1913, that Stump's bolus treatment (bolus alba) was tried at Nish by Kulme with remarkable results. Bolus alba, or kaolin (China clay), is aluminum silicate, $H_4Al_2Si_2O_9$, a salt insoluble in water, with crystals of 1 micron in length in a fine state of division. This salt was in use in early Roman times, and was also used by the natives of the Orinoco. It has also been employed in diphtheria in Germany, as a powder insufflated on the fauces and tonsils, and also a mixture internally. It has also been used in ptomaine poisoning with success (Mutch), also in dysenteries, summer diarrhea of children, and its use is indicated in the treatment of sprue and toxic conditions. The general effect of the salt seems to point to the absorption of toxins. By the use of this salt Kulme claims that the mortality in the cases treated was reduced from 60 to 3 per cent. The method of preparation was as follows: A suspension was made of equal amounts of water and kaolin, the kaolin being stirred into the cold water. Half-pint doses of this suspension were taken half-hourly for the first twelve hours; the second twelve hours several glasses were taken, according to the patient's condition. Vomiting soon ceased, the pulse improved, and the patient slept.

During the summer of 1919 China was visited by a severe epidemic of cholera, and Braafladt, of Tsinanfu, has given the result of the use of kaolin. The method of administration was somewhat different from Kulme's; and his treatments and results are as follows:

1. Hypertonic saline treatment, after Sir Leonard Rogers—mortality 22 per cent. Convalescents discharged on eighth day.

2. Kaolin and hypertonic treatment—mortality 29 per cent. Convalescent patients discharged on the sixth day.

3. Kaolin treatment only—mortality in 35 cases one patient (this patient died of gangrene of uterus after miscarriage). Convalescent patients discharged after four days.

All these patients had true cholera vibrios isolated during their stay in hospital. In cases of the Asiatic cholera treated in Foochow at the American Red Cross hospital when first opened no definite hard-and-fast line of treatment was maintained. Cases were treated by continuous subcutaneous injection of normal saline, with administration of potassium permanganate by the mouth, until the motions became green. Hypertonic intravenous saline injections (Rogers) were given in amounts up to three liters or until the blood-pressure became normal. Dextrose was added in some cases to the intravenous solutions.

Whatever method was used, some features of the disease remained constant:

First, that although the patient on arrival might appear moribund, being cold, rigid, and with imperceptible pulse, the introduction of saline could usually be relied on to produce return of consciousness and a greatly improved pulse. With the hypertonic intravenous solutions a rigor of great intensity could be looked for before the end of the introduction of the second liter. This, however, was disregarded and the saline was continued until the blood-pressure had attained the normal. A point of interest was noted in the treatment of these cases, namely, that when no superficial vein of the body could be demonstrated suitable for the introduction of the saline, through the extreme loss of fluid, or through the needling done by native physicians in the veins for the purpose of letting out the "toxic blood," the vein passing over the internal malleolus on the inner side of the foot could always be found.

Secondly, that relapses were the rule; sometimes even before the completion of the injection of a second patient was completed the first patient, through excessive diarrhea and vomiting, might be urgently requiring more fluid.

Thirdly, that those cases which could be supported until the acute diarrhea and vomiting had passed were still in grave danger from suppression of urine. This persisted in some cases for six days. The only remedy seemed to be the use of almost continuous "cupping," usually by means of a Bier's suction glass over both kidneys.

During the epidemic in Foochow in the summer of 1919 kaolin was used by him with considerable success, but there was difficulty in obtaining a good supply. On his return to Hing Hwa, where cholera was raging, he had no difficulty in obtaining kaolin, as the famous Blanc de Chine clay beds are situated near this district.

The method of administration was somewhat different from Stump's methods. A large supply of half-and-half suspension was placed near the patient, and the nurse was told to encourage the patient to take as much as possible. At the commencement large quantities could be tolerated, but as the vomiting and diarrhea ceased the liquid was refused. In all cases food was withheld for eighteen to twenty-four hours, then rice water was allowed, and later milk and rice water. In all cases rectal lavage was done with kaolin solution thickened until it would comfortably pass through the rectal tube. At first none was returned. Later on much was retained. If the condition of the patient was precarious on arrival at hospital, it was found that subcutaneous bilateral infusion usually restored the patient sufficiently to take kaolin by the mouth. In desperate cases hypertonic salt solution was given intravenously (Rogers), but no such large quantities as he used before the introduction of the kaolin treatment (2 liters). This is shown to be of value by the results obtained by Braafladt with hypertonic saline and kaolin, which were not so good as those obtained with kaolin alone.

After the introduction of the kaolin method the following differences were noted: If the patient's condition was "fair" —that is to say, that the pulse was perceptible and the patient conscious—the introduction of large quantities of kaolin suspension by the mouth and per rectum would insure the patient's continued recovery. After two hours all vomiting ceased, a sense of safety had been reached, and the patient usually slept.

In the lighter cases twelve hours saw the cessation of diarrhea, and twenty-four to thirty-six hours the passage of urine. In the most critical cases, which required the introduction of saline to bring about an improvement of the pulse, rectal introduction of heavy suspensions of kaolin were commenced at once and had a marked effect in preventing the further loss of fluid. On return of consciousness and during the introduction of the saline kaolin was given by the mouth and was usually retained, while in those cases which vomited it was felt that some kaolin had been deposited on the walls of the stomach which began to absorb the toxic products of the cholera

vibrio; the second administration of the kaolin suspension by the mouth was frequently retained or only partially returned.

So the most marked advantages of the kaolin treatment were: (1) Simplicity of method; (2) absence of relapse; (3) cessation of loss of fluid; (4) great improvement in the condition of the patient from the absorption of toxins, the patient becoming rapidly free from a general "toxic condition;" (5) early return of the passage of urine; (6) early and rapid convalescence.

In cases treated in St. Luke's Hospital, Hing Hwa, he had a series of 75 cases from one village, situated two hours' journey from hospital, with no fatal results, and this result was obtained in spite of the fact that many of the patients arrived at the hospital in a condition of extreme collapse. The mortality of untreated cases at this village was stated by the village headman to be exceedingly high, though he was unable to obtain exact figures owing to the absence in China of any registration of deaths.

Kaolin aids by absorbing toxins and coating the entire body, enmeshing the vibrios.

The Caseins of Cow's Milk and Human Milk in Their Relation to Infant Feeding.

BOSWORTH, in the *American Journal of Diseases of Children* for August, 1921, concludes that in cow's milk the casein is present as a calcium caseinate, while in human milk the casein is probably present as a potassium caseinate.

When rennin is added to solutions of casein (or milk) the casein is split into two equal molecules of paracasein.

The addition of rennin to solutions of casein (or milk) may or may not result in coagulation, depending on the nature of the salts in the solution (or milk).

Coagulation is promoted by soluble calcium salts and is retarded or inhibited by the addition of soluble salts of sodium, potassium, or ammonium.

The development of acidity in cow's milk favors coagulation after the addition of rennin; the greater the acidity the tougher the curds.

Milk, on entering the infant's stomach, is acted on by the enzymes present. The enzyme rennin, acting on casein, changes it to paracasein.

Breast milks contain small amounts of casein and small amounts of soluble calcium with relatively large amounts of sodium and potassium. The action of rennin on breast milk, therefore, results in no curdling or the production of only a very small amount of very finely divided curds.

Breast milk enters the mouth, the stomach, and the intestines in a liquid state. It does not form large curds in the stomach, and therefore cannot block the pylorus.

Cow's milk, reconstituted cow's milk, or any of its modifications contain large amounts of casein and soluble calcium with relatively small amounts of sodium and potassium. The action of rennin on these milks or their modifications, owing to their high casein and soluble calcium content, results in the production of large flocculent curds which at body temperature may coalesce and form large masses. These masses are a mixture of paracasein, fat, and milk salts.

Cow's milk, reconstituted cow's milk, or any of its modifications enter the mouth and stomach as a liquid, but in the stomach part of the milk may be separated into curds by the action of rennin. These curds may become very large, in fact, large enough to prevent their passage through the pylorus, and in some cases the pylorus may become blocked by them. These masses of curds may remain in the stomach for days and each feeding may add to their size.

Fresh cow's milk does not curdle on the addition of rennin. Curd formation depends on the development of acidity in the milk.

All milk used for infant feeding should be pasteurized immediately after milking.

Under no condition should old milk be used for infant feeding, even if it has been pasteurized thoroughly.

The modification of cow's milk, to adapt

it to infant feeding, should include some procedure to prevent the curdling of the casein.

The salts of milk, both on account of their nutritive value and the influence they have on the other food components of milk, demand more consideration than they now receive in infant feeding.

The influence of the salts on the mechanical condition of the milk after it reaches the stomach, on the digestibility of the other food components after digestion, and on the utilization of the vitamines of the milk, are pertinent questions which the pediatrician of to-day cannot answer intelligently, and because he cannot answer them he is quite likely to ignore them.

A Further Contribution to the Study of Pyloric Stenosis.

SAUER, in the *American Journal of Diseases of Children* for August, 1921, states that the parents should be told the nature of the ailment and that an operation may be necessary, but that thick cereal feedings will be tried for a short time to see whether the symptoms improve. The general condition of the patient, the stools, urine, vomitus, weight, food and feeding technique are closely watched. The presence of a palpable tumor or the size of the peristaltic waves has no bearing in making a decision. The weight, severity of vomiting, paucity of fecal material, complications, and the general condition of the patient are the factors that determine how long thick cereal feedings may be tried. Fluids, preferably 6-per-cent dextrose in Ringer's solution, are always given regularly by rectum or subcutaneously. If after a thorough trial (from one to two weeks) the vomiting fails to subside, if the weight fails to increase, or if the general condition of the child gets worse, operation is resorted to. In some cases conditions may be such that early operation may be advisable—for example, when infants come under observation in a very emaciated state and fail to respond immediately to the treatment.

With so much still unexplained about the mechanism of the normal pylorus, it is impossible to give a satisfactory explanation of how the thick cereal passes into the duodenum in case of pyloric stenosis, while the same food thinned out (to reduce its consistency) is promptly vomited. Moritz found that in the adult solid food inhibited and water stimulated gastric peristalsis. Schüle found fluid foods to increase the motility of the stomach. If one watches the events with the fluoroscope after ingestion of bismuth thick cereal it is seen that the mass gravitates to the pylorus and that more material passes through in a given time than with bismuth milk.

The use of thick cereal in thirty-five cases of pyloric stenosis brought about a rapid gain in weight in twenty-four, and was effective in twenty-eight of the thirty-five cases.

Patients should be operated on if the thick cereal fails to bring about improvement in from one to two weeks. Under certain conditions one should not wait too long before operation.

Complications following operation are not infrequent.

Thick cereal feedings may be valuable when vomiting continues after operation.

In cases of pyloric stenosis proper medical treatment, supported, when necessary, by proper operative treatment, will give the best results.

The Treatment of Functional Disorders of the Colon by Massage.

FLOYD, in the *Medical Record* of August 20, 1921, states that a considerable amount of fecal matter and an appreciable amount of gas are normal contents of the large intestine, and marked alteration in the quantity and character of its contents cause perversions of its normal function.

Pronounced departures from the normal activities of the muscular coat, either relaxation with dilatation or tonic contraction over increased contents, give rise to both subjective and objective symptoms.

Treatment should aim to restore the normal contents and activities of the colon

rather than to keep it empty and overstimulate its muscles and glands.

Abdominal massage is an excellent means to this end when less cumbersome methods fail.

Myocardial Lesions in Schoolchildren.

DANA, in the *Boston Medical and Surgical Journal* of August 25, 1921, concludes:

1. Proof of myocardial insufficiency is often to be found in supposedly healthy children. This may be evidenced in any one of the following ways:

(*a*) In the production of a relative mitral regurgitation as the result of exercise.

(*b*) In the movement of the apex beat outward or downward as the result of moderate exertion.

(*c*) In the appearance of a gallop rhythm after exercise.

2. Myocardial insufficiency of sudden onset is usually the result of an acute infection. Among infections affecting the heart, measles would seem to have an important place.

3. After an acute illness a child should not be discharged by his physician until an "effort test" produces no evidence of myocardial decompensation. In public schools the school physician should make this test on each child returning from quarantine to the school.

4. For the determination of the fundamental condition of the heart, more than one examination is necessary.

5. The routine cardiac examination of schoolchildren should be focused more than it now is upon the condition of the myocardium. Some form of effort test can be used even with the smallest children, and should be used as a routine.

6. Proof of permanent myocardial damage may be furnished in a child:

(*a*) By poor response to exercise on repeated examinations; this is to be interpreted in relation to the production of a murmur, of arrhythmia, of marked dyspnea, of gallop rhythm, rather than in regard to pulse-rate.

(*b*) By the presence of an enlarged heart, without murmurs.

(*c*) By the presence of persistent tachycardia, for which no other cause, such as tuberculosis or hyperthyroidism, can be found.

(*d*) By the persistence of a "functional" heart murmur for several years.

7. In a child over ten years old an apex beat more than 7 cm. from midsternum indicates enlargement of the heart. In smaller children the normal apex beat should not be more than from 5.5 to 6.5 cm. from the median line.

Digitalis should be used only in those children who show signs of decompensation when the heart is under normal strain.

8. In public-school children the care of a damaged myocardium is best controlled through the supervision and the limitation of athletic work by the school physician and by the teachers.

9. Children with compensated mitral regurgitation and giving a good response to effort, also children with compensated myocardial defects and a good effort response, should be permitted to take part in gymnastics and the less tiring sports.

The Diagnosis of Paralytic or Early Poliomyelitis.

LEVINE, in the *Boston Medical and Surgical Journal* of August 25, 1921, states that during an epidemic of poliomyelitis it is possible to diagnose the disease in the early stages before paralysis has developed, with a fair degree of accuracy. Every patient with unexplained fever should be examined for stiffness of the neck and the presence of the Kernig sign. If either one, or both, of these signs are present, a lumbar puncture should be done. This procedure is harmless and will save unnecessary anxiety both on the part of the patient's family and of the physician. A normal cell count practically rules out poliomyelitis. An increase in the cell count of the spinal fluid, with the other clinical features, will enable the clinician to make the

correct diagnosis of poliomyelitis. In this way the proper treatment and care of the patient will be instituted before paralysis has occurred.

Treatment of Acute Poliomyelitis.

BUZZARD, in the *British Medical Journal* of August 13, 1921, states that the treatment of acute poliomyelitis may be conveniently considered under three headings: (1) The treatment of the patient who is ill with the disease; (2) the treatment of the patient during convalescence; and (3) the treatment of resulting disabilities.

Before dealing with the first two stages it may be profitable to recall the knowledge we have gained from the examination of fatal cases. The condition of the brain and spinal cord when it is acutely inflamed and while that inflammation is susiding, the state of the nerve cells and their axons, and the reparative processes which are going on within the nervous system, should never be absent from the doctor's mind, and should influence his management of the patient at every turn. The presence of one or more paralyzed limbs must not divert attention from the disease and the healing processes which are running their course, not in the disabled members but in the hidden depths of the nervous system.

What are the outstanding anatomical features of the disease which deserve our profound attention? In the first place it must be remembered that the invasion of the brain and spinal cord is of much greater extent than appears on the surface. He has often been struck by this fact when examining fatal cases. For instance, a patient presenting paralysis of certain limb and trunk muscles dies from respiratory failure. Clinically the incidence of the disease has been on the spinal cord. Histologically there is abundant evidence of inflammation extending throughout the brain-stem and probably into the cerebral hemispheres. Let us recognize, therefore, that the whole of the nervous system has been subjected to an infection only some of the results of which may be manifest.

In the second place we must consider in detail what has befallen the cells of the anterior cornua before we set out on the muscles which they innervate. Take a typical section from the cervical or lumbosacral enlargement. The whole mass of gray matter is swollen, its vessels are engorged, and its tissues are the seat of abundant serous and cellular exudation, with here and there a capillary hemorrhage. The critical eye tells at once that such an inflammation, even under the best conditions, would take weeks to subside, and that the healing process demands rest above all things for its favorable development. Examine each group of cells. Some have disappeared finally and irrevocably; others are damaged beyond repair; others again, swollen and with displaced nuclei, may be considered hovering between life and death; while the remainder, few or many, constitute the only real survivors in the midst of the surrounding devastation.

Such a picture gives one food for thought when we are considering how to treat a patient who has passed through the febrile stage of his illness, who has regained his appetite, and who says he feels quite well except that he cannot move his arms or his legs. Handicapped as we are by having no efficient weapon with which to fight the infection, it is only reasonable that every effort should be directed toward assisting nature in the combat. The patient must be nursed with the greatest care, every unnecessary mental and physical effort should be saved him, and this policy of inactivity followed assiduously long after the constitutional symptoms have faded away. But masterly inactivity may be supplemented by more active measures in certain directions. The fever and malaise must be treated on the usual lines, and pain relieved by suitable methods, if necessary by morphine.

In the course of an epidemic it may be worth while trying the effect of an immune serum introduced into the spinal canal if the diagnosis has been made at a sufficiently early stage. It cannot be stated with

assurance that this method is of proved value, but some success has been claimed by several observers. For the purpose it is necessary to find some one who has passed through an attack of the disease, who is free from syphilitic taint, and who is willing to give 20 or 30 cc of his blood. The serum is separated, and at body temperature is injected into the spinal theca after removal of a corresponding quantity of cerebrospinal fluid. Injections of 10 cc may be repeated daily for several days. Obviously the conditions favorable for carrying out this treatment in practice can rarely be met with, and its employment after paralysis has once been established is not calculated to be of any value.

Hexamine is usually given in the acute stage of poliomyelitis, as in other infective diseases of the nervous system, on the ground that it reaches the spinal fluid in the shape of formaldehyde, but it is at least doubtful whether it exerts any beneficial effect.

Retention of urine needs to be met by the use of the catheter, but this complication is usually of short duration. Constipation is common in the early stages, but can be dealt with by means of aperients and enemata. It is apt to be obstinate when the abdominal muscles are paralyzed.

If rest is the first essential in the acute stage of poliomyelitis and during the first three or four weeks of convalescence, the posture maintained during this period is a good second. There is no one posture which is applicable to every case, but there is a principle which must decide the question of posture not only of the patient as a whole but of each portion of his body. This principle has been evolved from the knowledge that relaxation of a muscle is an imperative factor in its recovery, and that stretching a muscle is inimical to that desired result. Every case, therefore, needs to be studied in detail, the relative strength and weakness of antagonistic muscles operating on every joint accurately measured, and means adopted to maintain every segment of each affected limb in the position most favorable to recovery and least favorable to the development of deformities. At the same time the paralyzed parts must be kept warm and their local circulation and nutrition promoted by rubbing. During these first few weeks it is quite unnecessary to have a trained masseur to carry out this treatment, and any nurse should be able to do all that is required.

A month or six weeks having elapsed since the onset of the disease, the time has arrived when the condition of the patient's musculature should be carefully studied with a view to further treatment. It will now be found that certain muscles previously paralyzed have begun to respond to volitional stimuli. They do not present evidence of much atrophy, and they have not lost their response to faradism. These muscles will not give us any cause for anxiety in regard to their recovery. On the contrary, we may find it necessary to control their increasing activity lest by their contractions they may stretch other muscles which have been less fortunate.

A certain number of muscles will be found wasted and presenting the reaction of degeneration. The question of their recovery is one which cannot be answered at this stage, and we must be content to keep them in a condition as favorable for future activity as the circumstances permit. We know that some of these muscles may never contract again at the bid of their owner, that their innervating cells have been destroyed. Remembering the anatomical picture described, we realize that other muscles apparently in the same plight have more favorable prospects. Their innervating cells have been badly damaged but not destroyed. In time they may recover their function and be prepared to resume control over the muscle fibers to which their axons are distributed. It is our business to be prepared for this contingency at the end of a period which may be of a year or eighteen months' duration.

How is this time to be employed? We are ignorant of any therapeutic measure by which the recovery of the nerve cell and its axon can be facilitated or hastened, and

must therefore be content to maintain the patient's health at the highest possible level. We are more actively concerned with preserving the paralyzed muscle in such a condition that the advent of nervous impulses may find it capable of regeneration and without obstacles in the way of performing its natural function.

Experiment and experience have taught us that this end is best attained by keeping the muscle in a position of relaxation, by keeping it warm, by promoting its nutrition, and by preserving its contractility. It is with the last two measures that massage and electrical treatment are concerned, and they must be employed regularly and almost daily throughout the period of waiting.

The object of electrical treatment is to make the muscle contract, and it is waste of time as well as harmful to put the affected limb in a bath of water through which an electrical current is passed. Each muscle must be stimulated by the make-and-break of a galvanic current, care being exercised that the latter does not spread to antagonistic muscles the contraction of which would stretch the paralyzed fibers.

At the end of eighteen months of appropriate treatment on these lines the patient may be regarded as having reached the stage when any further mitigation of his disablement must depend on artifice or operation. It is to the orthopedic surgeon that he must turn for help, and, in view of the great advances made in this special branch of surgery during recent years, he will not turn in vain.

Luminal Contrasted with Bromide in Epilepsy.

GOLLA, in the *British Medical Journal* of August 27, 1921, states that a study of the results he records shows that 36 cases out of a total of 125 were either not improved or deteriorated under luminal treatment, whilst the remainder did better under luminal than under bromide. The cases most beneficially affected by luminal were those with fits occurring at frequent intervals, and the cases least affected were those whose fits occurred in bouts at considerable intervals of time.

The interpretation of these results is a matter of some difficulty; to make the experiment complete it would be necessary to know the frequency with which the fits would have occurred when the patients were observed for lengthy periods in an untreated condition, and this for obvious reasons was impossible. He hesitates to believe that luminal exercises a selective action on these forms of epilepsy in which the fits occur with the greatest frequency. It appears to be more probable that a class of epileptics exists who are more refractory to bromide treatment than others; such a class would obviously show the greatest number of fits when treated by bromides, but at the same time these patients are not less susceptible to luminal than their fellows, and consequently it is with these cases that the drug shows its most marked effect.

The doses of luminal employed have rarely exceeded 6 grains a day of the sodium salt. Using such small doses he has hitherto been unsuccessful in determining to what degree, if any, it undergoes change in the body. The only method so far available of recovering it from the urine is to shake it out with ether, and when the total weight recoverable in a twenty-four-hour specimen of urine does not exceed 6 grains it is futile to pronounce on the possible destruction of small fractions in the body. The sodium salt was administered on all occasions on account of its solubility, but there is little doubt that in the acid stomach it is converted into the insoluble acid.

It is the rapidity with which the insoluble acid is passed on to the duodenum and its relative dilution with the gastric contents that may, by varying the rapidity of absorption, be responsible for the occasional appearance of slight toxic symptoms such as giddiness and drowsiness. The earliest period after ingestion at which he has been able to demonstrate its presence in the urine is three hours.

The drug is, as a rule, well tolerated, and most patients found that they were far

brighter and more cheerful after a change to luminal from bromide treatment. In twelve cases, however, the patients complained of giddiness and drowsiness. Five of these patients showed definite affection of the gait, reeling slightly as if under the influence of alcohol. By diminishing the dose of luminal he was able to secure eventual toleration in all but four patients, who complained so persistently of giddiness that the luminal treatment was suspended. Urticarial rashes appeared in two cases at the onset of treatment, but disappeared when it had been continued for a few days.

There has in no case been any signs of the formation of a drug habit, and suspension of the treatment has never given rise to any disturbance. There is a tendency in all cases for the number of fits to increase slightly after the first two months of treatment. He has refrained from increasing the strength of the dose given, as he wished to determine whether this tolerance was a progressively increasing factor, but he found little evidence of this. In a series of 20 cases the average number of fits per month after a month's treatment was 21; after two months, 30; after four months, 36; and after ten months, 32.

Preliminary Report on the Use of Diallylbarbituric Acid and Ethyl Morphine in Obstetrics.

McNeile, in the *Southern California Practitioner* for August, 1921, states that in 1917 his attention was called to a report of a small series of cases in one of the German clinics, in which the use of ethyl morphine in combination with diallylbarbituric acid was tried in an effort to produce what they termed a "new twilight sleep."

Ethyl morphine is the so-called dionin commonly used by ophthalmologists, and possesses a pronounced sedative and analgesic action. It is rapidly oxidized, is relatively non-toxic, and when administered to a pregnant woman at any stage of labor does not apparently have any effect in decreasing the strength of the uterine contractions, nor is there any apparent effect upon the infant.

Diallylbarbituric acid is a well known and commonly used hypnotic, apparently non-toxic when administered in 1½-grain doses, which may be repeated at hourly intervals up to a maximum of four doses.

Hussy, at the Woman's Hospital, Basle, Switzerland, used a combination of the two drugs which proved to be a characteristic compound containing 61.4 per cent ethyl morphine and 38.6 per cent diallylbarbituric acid. In his series he found that the drug had a quieting effect upon the mother, that pain was relieved to a considerable extent, that uterine contractions were strengthened and the interval between contractions decreased, that uterine atony and fetal asphyxia were not observed more frequently than had been noted without the use of the drug, and that amnesia was seldom observed.

From this and several other reports which were brought to his attention, he felt that there might be some advantage in making an independent investigation. The drug was ordered in April, 1918, from the Society of Chemical Industry, at Basle, Switzerland, and arrived in June, 1920. This report is based on the personal observations of himself and his assistants upon private patients. They are at present doing some work on one of the obstetrical services at the Los Angeles County Hospital, but these reports are not available at present. In all 100 cases were studied.

Their object was to determine whether or not the combination described possessed any properties for the relief of pain during labor, or had any effect upon labor, or might result in any untoward effects upon mother or child.

The drug was administered by mouth only. In general he believes that the best effects were observed when the tablets were dissolved in one-third glass of warm water.

In no case was the drug administered prior to the establishment of regular labor pains, and beginning dilatation. In general the first tablet was given when the pains were of the five- to eight-minute type, and dilatation two to three fingers.

Routine orders were given to repeat the

dose in one hour. In only three cases were three doses given.

In accordance with his usual custom he used nitrous-oxide-oxygen or ether in every case as the head was passing over the perineum.

The effect sets in quite rapidly, as a rule in from 13 to 30 minutes after the administration of the first tablet. The mother becomes somewhat sleepy, and this effect is increased after the administration of the second tablet. The tendency to sleep between pains becomes very pronounced, and the evidences of pain during uterine contractions, especially the vocal outcry, are markedly decreased. There is never amnesia, and he has never observed the effect described by the twilight sleep advocates, that of deep sleep, with stertorous respiration.

He has noted in nearly all of his cases that the strength of the uterine contractions is increased, and that the interval is decreased.

In his opinion the most pronounced effect has been upon the cervix. In over 80 per cent of his cases there has been an almost immediate relaxation of the cervix, and very rapid dilatation. This has been especially pronounced in several cases of so-called "wiry os."

In no case was there any asphyxia observed, and there were no still-births. He realizes that this is more or less accidental, since in any series of 100 deliveries one would expect some morbidity. It would indicate to him, however, that the drug does not have any pronounced effect upon the child. No after-effects which could be traced to the drug were observed.

In no case was there any prolongation of the third stage, nor any evidence of more than the usual amount of hemorrhage. The patients did not seem to be particularly sleepy after delivery.

A vast majority of the patients were primiparæ. Several of the multiparæ volunteered the statement that their suffering had been markedly alleviated after the administration of the tablets, particularly as compared with previous labors.

His tentative conclusions are:

1. In this combination of drugs we have an agent which has considerable effect in relieving the pain of labor.

2. In connection with this effect, *i.e.*, the alleviation of pain, we believe that the drug strengthens uterine contractions, decreases the interval between contractions, and promotes relaxation of the cervix.

3. He has not observed any ill effects upon either the mother or child.

4. He has observed about 5 per cent of absolute failures, and 20 per cent of comparative failures.

This drug is not a cure-all, and in all probability is not suitable for routine administration to cases in labor. In his opinion its greatest advantage lies in the simplicity in the method of its employment, and its place of greatest usefulness will probably prove to be that group of cases in which the patient is a nervous, high-strung woman, and in whom examination shows weak or ineffective uterine contractions associated with a rigid cervix.

[Diallylbarbituric acid is marketed in this country under the name of Dial Ciba. —Ed.]

Radiation in the Treatment of Diseases of the Blood.

Gulland, in the *British Medical Journal* of August 20, 1921, gives the general impression which a fairly long clinical experience of the blood diseases has left on his mind. He recalls the enthusiasm with which we hailed the first cases of myelocythemia which were treated by *x*-rays. As it chanced, in Edinburgh, all these cases were very successful. The spleen melted away, the white count fell rapidly, the urine showed the big excretion of uric acid which goes with leucocyte destruction, and the general condition of the patients improved markedly. But as time went on they found that the cases relapsed, and they met with many refractory cases, and he has never again experienced such uniform success as in the first cases.

He states that we must keep in mind what it is that we try to do in using radiation. It has shown its value in the removal of inflammatory products, using the term in its widest sense to include such conditions as lymphadenoma, in restraining the abnormal cell growth in neoplasms of all kinds, and in causing the destruction and removal not only of neoplastic cells, but of cells which have assumed an exaggerated function, such as the thyroid cells in exophthalmic goitre. But it is a two-edged weapon in this respect, for what one may call its calming effect may be preceded or followed by a stimulating effect. The former result is, perhaps, best seen in some cases of exophthalmic goitre, in which one finds that radiation will at first produce a marked increase of symptoms, followed later by improvement. The latter result is illustrated by the neoplastic change which may follow on radiation, and it is even possible that the relapses which occur in myelocythemia, for instance, may to some extent be caused by this stimulating effect, though, from the ordinary tendency of this disease to relapse, this is a matter probably incapable of proof. He confesses, however, that it has seemed to him that the more energetically a case was treated the more certain it was to relapse in a relatively short time.

In which of the blood diseases, then, is radiation likely to be useful? Obviously in those associated with hyperplasia rather than in those with hypoplasia of the blood elements, in the leukemias rather than the anemias. No one would attempt to treat a secondary anemia by radiation of the spleen or long bones. The place of radiation in these conditions, if it is indicated at all, is in the treatment of the causal agents—cancers, uterine myomata, etc.—in so far as these are not susceptible of removal in other ways. Chlorosis, if it is really due to an excess of blood plasma and the attempt of an overworked marrow to keep the plasma full of corpuscles, might conceivably be treated by radiation; but so long as ferrous carbonate is to be obtained even the most enthusiastic radiologist would hardly experiment in this direction.

Pernicious anemia merits more consideration, for though there is in it a hypoplasia of the elements of the circulating blood, there is great hyperplasia of both the red and white corpuscle-formers in the marrow. But whatever theory of the causation of the disease one adopts, there is no doubt that this hyperplasia is necessary and must not be interfered with. His own view of the disease is that it is most often a toxic interference with the proper adult normoblastic blood formation, with the result that the embryonic megaloblastic type of blood formation is again called into action to replace or more usually to supplement the normal function which is temporarily more or less in abeyance. The hyperplasia of the marrow is due to the fact that the death-rate of the red corpuscles is high, and regeneration requires to be as rapid as possible. Obviously, therefore, it must not be checked, and radiation is contraindicated. Many years ago he tried the effect of *x*-rays on a series of cases of pernicious anemia, with uniformly disappointing clinical results. It is further to be noted that radiation has much less effect on tissues of primitive embryonic or undifferentiated type than on those more fully developed. It destroys normoblasts more easily than megaloblasts, neutrophiles more easily than lymphocytes, myelocytes more easily than myeloblasts. Therefore, radiation in pernicious anemia would still further interfere with the normoblastic function, and the whole purpose of treatment in the disease is to encourage and restore this. If it becomes possible in the future to increase and utilize the stimulating effect of radiation and to exclude its destructive effect, it may yet come to be of service. Occasionally one sees reports of cases of pernicious anemia which have recovered under radiation. He believes that this recovery is not due to radiation but in spite of it. Certain cases of pernicious anemia, in their first and second attacks particularly, have so strong a tendency to recovery that they will get well under the most inappropriate medication, and it is necessary in this disease, in testing any new remedy, to try it in a series of cases, and especially in the later relapses.

Aplastic anemia in its relation to radiation has lately been brought into prominence—he hopes into a temporary and accidental prominence rather than a permanent and essential one. There are comparatively few places in which there can be such constant exposure to radiation as in the Radium Institute, and except in isolated cases the radiologist seems to escape anemia—at least, none of Gulland's radiological friends appear to suffer from it—while the leucopenia which radiation induces is not associated with ill health. He finds that many perfectly normal people have a white count persistently subnormal. The dangers of a radiologist's life are quite sufficiently great without the addition of a new one, and we all trust that means of protection from it will be found. There is no doubt whatever that radiation, when carried too far, is capable of exhausting the marrow—a power which it shares with arsenic, mercury, and other drugs if they are pushed unduly. Gulland refers later to this in discussing myelocythemia. Most of the cases in which aplastic anemia is produced by radiation appear to pass through a pernicious anemia stage of high color index before reaching the aplastic stage, for the reason which he has already given, that normoblasts are more readily affected than megaloblasts. Indeed, he regards this fact as one of the strong arguments in favor of his view of the causation of pernicious anemia, that it is an inhibition of normoblastic function.

One would like very much to know whether it is possible to produce aplastic anemia in every one by excessive radiation, for in the ordinary disease, as one knows it apart from radiation, the primary difficulty is almost certainly a congenital deficiency in the bone-marrow, which makes it unable to respond to excessive calls upon it. None of Gulland's cases of aplastic anemia had ever been exposed to radiation; in some there had been hemorrhage or septic infection, or the strain of an operation, as the starting-point; in others there was no discoverable cause. In isolated cases it may chance that a man with this defective marrow may have the scales turned against him by the constant exposure to radiation, but one hopes it is not to be a common occurrence.

There is is one disease of the blood in which radiation deserves a much more systematic trial than it has yet received—polycythæmia vera, or Vaquez's disease. Its main features are a great increase of the circulating red corpuscles, often to double the normal number or more, with high blood-pressure, and usually with enlargement of the spleen. The cases are very rare, and since it occurred to him to try radiation in them he has seen only one case. In this a course of *x*-ray treatment was commenced, but had to be stopped for family reasons. The patient died some time later of cerebral hemorrhage, out of observation. The marrow in this condition is unduly active, and it is possible that radiation of the long bones might be useful in checking the increased output of red corpuscles. The conflicting results which have been published may perhaps be due to error in diagnosis to some extent, for there are numerous secondary polycythemias which one could not hope to influence favorably by radiation.

In discussing the leukemias one must remember that for practical purposes there are three main varieties—chronic myelocythemia (the commonest), chronic lymphocythemia, and the so-called acute lymphocythemia or acute lymphatic leukemia, which is usually really an acute myeloblastemia, and which is probably next in frequency to the first form. These react very differently to radiation. The actual cause of the conditions is not known, but a good working hypothesis is that it is due to a neoplastic hyperplasia of different forms of leucocytes. The mobility of the cells involved, as a rule, prevents the formation of any local tumor, though tumors do occur at times, but the cells flood the blood and pervade the organs, showing a special tendency to settle down in the large venous spaces found in the spleen, and to a less extent in the liver and other organs. This results in the familiar enlargement of the spleen,

which occurs to a varying extent in all forms of the disease—the more chronic the case the greater the enlargement of the spleen. Part of the enlargement is due to this mechanical distention, part to the fact that as the spleen has to deal with effete cells in the blood it hypertrophies for this purpose, and part to increase of fibrous tissue. The spleen is in no case the starting-point of the disease, and the successful results which used to be obtained from *x*-raying the spleen alone in myelocythemia before treatment of the long bones was introduced are probably to be attributed to the fact that the organ is extremely vascular, and that a large part of the blood must pass through it and be exposed to radiation.

He then discusses the three varieties. It has long been known that radiation was useless, and probably harmful, in acute lymphatic leukemia. In this form the starting point is always in the marrow. The myeloblasts, the precursors of the myelocyte forms of the three series of granular leucocytes—neutrophile, eosinophile, and basophile—are only found in the marrow in normal adults, and it is they which proliferate in this disease. Gulland does not discuss how many of these cases are myeloblastic and how many lymphocytic. The condition is sometimes so acute that there may be very little enlargement of the spleen and even none of the lymphatic glands, while the marrow is packed with myeloblasts which take up all the available space and oust the formers of red corpuscles. The result is a very rapid anemia, often of aplastic type, for it matters very little practically whether a terminal anemia is caused by an inability of the red cells to proliferate, as in aplastic anemia, or by the filling up of the space in which they can be formed by other cells. In the more chronic leukemias there is time for red blood formation to overflow into the circulating blood and into the spleen and liver; in the acute form there is no opportunity for this to happen. The rapidly proliferating undifferentiated myeloblasts are apparently not affected by radiation; in some cases in which Gulland tried its effect there was always a rise of temperature and apparently an increase in the rapidity of the anemia as a result.

The most favorable form for radiation is chronic myelocythemia, and in regard to this disease a very large amount of experience has now been accumulated. Some time ago, as he was disappointed with *x*-ray results, he began treating all his cases with radium, and while he cannot say that the benefit produced has been any more permanent, it has been more certain and more rapid, and it has seemed to him that the patients improved more in general condition, and especially in recovering from their anemia. He leaves it to the radiologists to discuss the reason of this if the opinion is borne out by other physicians. The first obvious effect of radiation is a reduction in the white count, which may drop by two or three hundred thousand in a few days. The cells most affected are the neutrophiles, of both the myelocyte and polymorphonuclear forms. Next come the eosinophiles and basophiles, while the lymphocytes and myeloblasts are less affected. Degenerated cells are always found in myelocythemic blood, but they become more frequent in radiated cases. The normoblasts, which are often present in large numbers, disappear, and in successful cases the blood may return to practically a normal appearance, though one can generally find some abnormal cells. The spleen diminishes in size. He does not think he has ever seen it go back quite to the normal, but it may be just palpable under the ribs and no more. As the fibrous tissue is increased one would hardly expect it to reach normal in size.

Experiences with Sodium Arsphenamine.

MICHELSON and SIPERSTEIN, in the *Archives of Dermatology and Syphilology* for August, 1921, state that sodium arsphenamine offers the physical and therapeutic features of arsphenamine in convenient form, but it is difficult, from a clinical experience, to arrive at an accurate determination of the relative value of the various

arsphenamines. Suffice it to say that sodium arsphenamine exerts a marked effect on cutaneous and mucous membrane lesions of syphilis, and that this action is almost as rapid and profound as when arsphenamine or neoarsphenamine is employed.

The dosage employed by them was small. Marked effect was produced on lesions with 0.3 gm. given to males of approximately 150 pounds weight. From their observations they believe that 0.45 gm. is a safe and efficient dose, and they noted that doses of 0.6 gm., although borne without severe reactions, nevertheless produced a certain effect on the patient, which patients described as "makes me feel sort of tired" or "I'm kind of grippy."

They used a dilution of 20 cc with the first doses given. This dilution was gradually and cautiously decreased to 10 cc. No change in effect or safety of administration was noted.

They found that a course of six doses of from 0.3 gm. to 0.6 gm. made an optimum course. Injections subsequent to six doses often produced minor symptoms of intolerance (gastric distress, itching sensation).

Injections were made daily for three doses; injections were made every forty-eight hours for three doses; biweekly injections for six doses and weekly injections for six doses were made without any symptoms which could be attributed to the interval. They believe that in all arsphenamine courses the patient must be carefully watched and questioned for early warning symptoms on the part of the organism against arsenic, and that the slightest significant symptom should cause the operator to delay subsequent injections in order to avoid accumulative effect. They have not observed a case of exfoliative dermatitis which was the result of an initial dose of any of the arsphenamines. Their cases of dermatitis have occurred after repeated doses, and when they have carefully questioned the patient afterwards they have discovered minor symptoms which they did not heed at the time, making their subsequent injection in spite of the warning, with a resulting dermatitis. They wish to call attention to two such minor symptoms: First, itching, which appears shortly after injection and lasts for from twelve to twenty-four hours. They have learned to accept this as a distinct warning to lengthen the period between injections and to lower the dose. Second, substernal or epigastric, dull, but persistent pain.

Constant use of the arsphenamines breeds contempt. Operators make light of the injection; patients speak in jocular terms of their "shot;" and they exhibit a bravado when in groups at a clinic which causes them to conceal, or at least not to mention, minor symptoms. These factors cause one to overlook the gravity of the occasion and the dangers which are lurking in antisyphilitic treatments. The responsibility rests with the operator, and we believe that many of the minor and major effects of arsenic intolerance can be avoided by a carefully regulated dose and interval.

These authors most emphatically believe that sodium arsphenamine does not possess any qualities which permits the omission of supplemental treatment with mercury.

Sodium arsphenamine does not change a positive Wassermann reaction to negative any faster, or slower, than any of the other arsphenamines the authors have used. They believe that this change is to a large degree dependent on the age of infection at the time treatment is instituted and on individual response to a certain amount of therapy.

They conclude:

1. Sodium arsphenamine is a readily soluble, easily administered, and safe preparation.

2. Sodium arsphenamine exerts a marked influence on clinical manifestations of syphilis.

3. They believe that courses of sodium arsphenamine should be supplemented with mercury.

4. The therapeutic efficiency is apparently equal to that of the other arsphenamines (clinically).

5. The effect on the Wassermann reaction is about on a par with that of the other arsphenamines.

Treatment of Rickets.

In the *British Journal of Children's Diseases* for July-September, 1921, BURNET states that we must, in the first place, consider its prophylaxis. Bearing in mind its chief cause, we would insist on a ban being placed on "infant foods," dried milk and condensed milk. He believes the way these are used in infant feeding is most reprehensible, and does not reflect credit on those who so use them; nor is the practice in keeping with the progress of pediatric medicine. He cannot too strongly affirm his condemnation of every one of these things in the routine feeding of infants. If breast-milk is not available, then the only proper substitute is either scalded cow's milk, pure or diluted with water, or citrated. There is no other proper substitute for breast-milk.

When an infant is suffering from rickets it is obvious that we must stop the harmful agent, and order it to be fed only on cow's milk. This is the first step toward successful treatment of the case. As an adjunct, but only as such, we may order cod-liver oil, either pure or in the form of a good emulsion. He asserts that petroleum oil cannot replace cod-liver oil in the treatment of rickets; nor does he place any faith in phosphorus. When the latter is combined with oleum morrhuæ good results are said to be obtained; but it is the cod-liver oil, not the phosphorus, which brings about the improvement in the infant's condition. Some believe that oleum morrhuæ tends to produce fatty changes in the liver. Personally Burnet is inclined to question this. At the same time it is a mistake to give the oil in too large doses. A few drops to an infant of six months thrice daily is generally quite sufficient. Fresh air and sunlight and massage of the limbs with olive oil are useful additional measures. Usually at the outset there are more or less marked symptoms of indigestion. These should first be remedied by a course of calomel in minute doses of one-sixth of a grain thrice daily, supplemented later by such drugs as sodium bicarbonate and bismuth carbonate. If constipation is a marked feature of the case magnesia or a few minims of fluid extract of cascara will generally be found to do good.

Artificial Pneumothorax.

RIVIERE, in the *Proceedings of the Royal Society of Medicine* for September, 1921, states that the prime essential to success lies in the proper selection of cases. There must be excluded on the one hand those who could recover by other means, and on the other hand those for whom a pneumothorax would merely mean acceleration of their inevitable end. Forlanini's dictum could, perhaps, hardly be improved upon. "Pneumothorax," he remarked, "is indicated every time that life is threatened by the extension of a local lesion." This is not saying, of course, that all such cases are suitable, since contraindications may exist, but in all such cases the question of a pneumothorax demands investigation. In practice it is surprising how many cases with disease of the whole of one lung turn up for this treatment. This is not, he is convinced, as a rule due to the negligence of physicians, who have allowed disease to spread from apex to base before they awoke to the need of doing something, but disease in these cases is of hilum origin, has progressed in the deep parts of the lung, and on reaching the surface is soon evident to auscultation over the whole of one side. In such patients the *x*-rays often reveal advanced disease of the opposite lung also, though to the stethoscope it may appear quite sound because the process has not yet reached the surface.

For this reason it is imperative, where at all possible, that a radiogram be taken before a pneumothorax is embarked upon, for above all other considerations the condition of the other lung is the point of the most moment. How much disease might be permitted in the other lung without its forming a contraindication to pneumothorax is a matter which cannot be described on paper, and is often very difficult to decide upon in practice. In his experience the

question of activity is of far greater importance in this decision than extent or locality of disease. The other lung is rarely altogether free of disease, unless in pneumonic cases, and in these, nevertheless, the prognosis is bad. But torpid lesions, even of wide extent, may be expected to clear up or improve—the strain of increased function seems to be more than counterbalanced in these cases by the removal of focal reactions and toxemia, and the effects of the hyperemia which is probably brought about. Active lesions on the other hand tend to spread and get worse. But even to this there may perhaps be exceptions. Many writers, notably, to his recollection, Mary Lapham, and Parfitt and Crombie, had recorded improvement and recovery under pneumothorax in cases in which the other lung was so bad as to appear to be a contraindication. In some of these the *x*-rays had not been used till after the pneumothorax had been initiated, and the writers were therefore inclined to discount the *x*-ray findings somewhat in deciding on the suitability of a case. Nevertheless, the *x*-ray must be their standby, and if they are to extend their field of treatment to cases of more doubtful suitability it can only be through increased experience of the radiological appearances.

One of the warnings he would utter, while speaking on the selection of cases, is against mistaking conducted sounds for evidence of disease in the better lung. Sharp consonating crepitations are nearly always audible on the opposite side near the spine, and not infrequently about the axilla, though curiously enough they may be less plainly heard, in some of these cases, in the area between these points. A pneumothorax will often unexpectedly remove sounds in the functioning lung, and frequently, he is sure, these sounds have been merely conducted. Crepitations at the base or round the heart on the good side are not always, he thinks, a contraindication to pneumothorax, where the *x*-rays show only quiet peribronchial disease. Such signs may clear as treatment progresses. In cases in which the better lung is of doubtful reliability, a waiting period of complete rest may improve matters—but in other cases the chance of doing a pneumothorax may, through waiting, pass by and be lost.

To pass over the initial operation, of which he has nothing new to remark, and to come straight to the continuation of a pneumothorax already induced, he refers to the intervals between refills and the quantity of gas it is wise to introduce. He finds a tendency in England to give larger fillings, and hence at longer intervals than are advised by the most experienced Continental authorities. For example, Forlanini, in Italy, recommends only 200 to 300 cc, rising at most to 500 cc at each filling. Dumarest, in France, rarely leaves longer than three weeks between refills, unless in cases of thickened pleura; Brauer and Spengler, in Germany and Switzerland respectively, advise 400 to 800 cc. In England fillings of 1000 cc or more seem to be approved of, and one authority is teaching, he is informed, that the intervals achieved should be one month in the first year, two months in the second year, and three months in the third year of treatment. This has led, in one case he believes, at least to the need for two refills on consecutive days before the pneumothorax could be reëstablished at its former volume and pressure. Such a release of collapse seems very undesirable, and is condemned on grounds of post-mortem experience by some of the best authorities. Personally he has found that it is not possible to fix any standard interval between refills, but each case must be a law to itself.

Wood Alcohol Poisoning.

In an editorial on this subject the *Lancet* of September 17, 1921, states that a good deal has been heard in America on wood alcohol poisoning, more especially since the adoption of the prohibition policy. The acute toxic symptoms which may be rapidly fatal are generally accompanied by blindness, partial or complete, or blindness may ensue in a case in which acute systemic symptoms have been wholly

absent. In cases that survive partial recovery of sight is not uncommon. Ziegler believes that the primary and fundamental lesion in all cases is a profound injury of the pituitary body. "The changing but steadily contracting fields, the fugitive scotomata, the visual loss and recovery, the sclerosed or atrophied nerve-heads, the fixed and dilated pupils, the temporary paresis of the extra-ocular muscles, the ptosis, the ataxic gait and the mental hebetude are all characteristic of pituitary involvement." He records six cases, in most of which recovery of vision took place. It is to be noted, however, that these were not recent cases, but all dated from before the era of prohibition. The treatment adopted included the administration of alkalies and negative galvanism applied directly to the eye. A point worth noting is that the end-product excreted by the kidneys is formic acid and that this reduces Fehling's solution, so that a wrong diagnosis of diabetes is quite possible.

The Advantage of Serum Therapy as Shown by a Comparison of Various Methods of Treatment of Anthrax.

In the *American Journal of the Medical Sciences* for September, 1921, REGAN in concluding states the local therapy of anthrax in common use should be abandoned, owing to the disadvantages or even dangers it possesses. These disadvantages include scarring and disfigurement, pain, danger of secondary infection being introduced, liability of spreading the disease locally or into the circulation, prolongation of convalescence, and, but most important of all, its lack of any specific effect upon the course of the malady and its uselessness when the pustule is voluminous and when a septicemia has originated. The pustule is best left to its own evolution rather than to employ the more radical measures, owing to their tendency to disseminate and generalize the local diseases, while the palliative measures exert their effect entirely too superficially for any direct curative value.

The value, both prophylactic and curative, of antianthrax serum must now be regarded as established by statistics. Its well-nigh specific nature in the therapy of the disease must be recognized by the profession. The mortality from malignant pustule will be reduced to a minimum by prompt recognition and early serum treatment.

No case of anthrax septicemia should be considered beyond hope until intensive serum therapy has failed.

The serum prepared by the Bureau of Animal Industry or according to their method has been proved of marked potency, being according to certain reports twice the strength of the European preparations.

As originally described by Regan, the local injection of anthrax serum into the pustule is apparently the most effective means of local therapy and should always be used as a supplementary measure to the general administration of serum.

Anthrax serum fulfils best the points requisite for an ideal method of treatment of anthrax: (1) It is applicable to all forms and locations of the disease; (2) yields on the average the lowest mortality rate; (3) is a specific measure; (4) is a safeguard against generalization of the local disease if used in time; (5) offers the least amount of scarring and deformity; (6) causes a minimum of pain; (7) demands on an average the shortest absence from employment.

Treatment of Scabies and Pediculosis by Benzine.

The *British Medical Journal* of September 10, 1921, in its Epitome of Current Medical Literature, quotes an article by ARTAUT DE VEVEY (*Bull. Soc. de Ther.*) which states that though the parasiticide properties of benzine are well known to naturalists, especially entomologists, they are not generally recognized by the medical profession. He has frequently found that a garden syringe filled with benzine is sufficient to rid a house of ants, beetles, and cockroaches. In the case of scabies treatment consists in swabbing the region

affected with benzine and applying at night an ointment composed of 10 grammes of benzine with 50 grammes of lanolin, and covering it with wool. The following morning the ointment is washed off with soap and a cure is effected. The body linen and clothes are disinfected by sprinkling them with benzine and putting them in a closed chest for a few hours. In pediculosis capitis the scalp is swabbed with benzine and the head covered with a paper or cloth cap for an hour. Not more than 10 to 15 cc of benzine need be used. In the case of body lice the axillæ, groins, and flexures of the limbs should be swabbed, and the clothes and linen treated as in the case of scabies. The only drawback to the treatment is the inflammability of benzine, but danger from this cause can easily be avoided. The applications are not painful except on excoriations.

The Influence of Fasting and Diet on Arsphenamine Poisoning and the Comparative Toxicity of Arsphenamine, Neoarsphenamine and Para-oxy-meta-amino-phenyl-arsenoxide.

HOOPER, KOLLS, and WRIGHT, in the *Journal of Pharmacology and Experimental Therapeutics* for September, 1921, in summarizing their article on this subject, state:

The pathology of experimental arsphenamine, neoarsphenamine, and p-oxy-m-amino-phenyl-arsenoxide poisoning is described on a quantitative basis.

Starved animals and those fed sugar alone in the days preceding the intravenous administration of sodium arsphenamine are very susceptible to arsphenamine poisoning. A maximal kidney injury is to be expected.

A diet of white bread, rolled oats and whole milk greatly increases the resistance and exerts a marked protective action against the kidney injury.

A method is proposed for the standardization of the rat for the biological testing of drugs. Accurate diet control in the days preceding the administration of the drug is very important. Animals unfit for the test may be detected by following the weight curves.

Neoarsphenamine is much more toxic to the rat and dog kidney than sodium arsphenamine. The kidney injury produced by arsphenamine is transient, while that caused by neoarsphenamine may be permanent.

Para-oxy-meta-amino-phenyl-arsenoxide has been found to be five times more toxic to the rat kidney than neoarsphenamine when compared on an arsenic equivalent basis, and seven and one-half times more toxic than sodium arsphenamine.

Administration of mercury in doses corresponding to therapeutic doses in man apparently does not materially increase the severity of the renal injury produced by arsphenamine.

Lethal doses of sodium arsphenamine administered intravenously to dogs on a diet of medium fat beef may be followed by jaundice and liver necrosis in some instances comparable with acute yellow atrophy.

Arsphenamine and neoarsphenamine react differently in the animal organism and should not be considered as one and the same compound.

Good preparations of arsphenamine and neoarsphenamine when administered in doses corresponding to those ordinarily used clinically are harmless to the normal animal organism.

The Treatment in Tuberculosis of the Larynx.

In the *Journal-Lancet* for September, 1921, GREGG states that in the treatment of laryngeal tuberculosis there are certain general features on which all are agreed. The first of these is the influence of careful supervision of the daily life of the patient, his rest, diet, hygiene, exercise, and so on. One should insist that the patient be under sanatorium or hospital treatment, for those who will not place themselves under such care are hampering their progress and, in many instances, turning the balance from recovery to a fatal termination. All of his

cases were patients at the State Sanatorium, with which he has the closest coöperation; and it has been largely due to this coöperation that good results have been obtained. Much depends on the patient's determination to do his part, and this unquestionably is made easier by the carefully regulated sanatorium life.

Absolute rest of voice is insisted upon for all, regardless of what their other treatment may be. Some cases of laryngeal tuberculosis are cured wholly by silence.

Steam inhalations, using compound tincture of benzoin twice daily, are given at the Sanatorium.

Lactic acid, in 50-per-cent solution, is applied daily to the larynx, the exact lesion being brushed carefully with it. Formalin is used in some cases, beginning with a very weak solution and gradually increasing the strength as rapidly and as far as the patient seems to do well on it. He has applied it in 2-per-cent solution with no discomfort to the patient. Some larynges will do best under one form of treatment; others will demand different treatment. It is only by keeping close watch of the larynx that one gains the best results.

For relief of dysphagia he uses orthoform or anesthesin injection of the superior laryngeal nerves, and where the epiglottis is involved amputation of this structure. It is well to state here that, aside from the relief of pain, the laryngeal lesion is in some cases favorably affected by removal of the epiglottis. This is due more indirectly than directly to the operation; deglutition is made easier and the increased alimentation results in improvement in the general condition.

In cases in which the general condition is very poor, or in which there is a continued and pronounced breaking down in the lungs, only the above treatment is used. This is also true of the cases in which practically the entire larynx is involved.

Given cases that have a fair chance of recovery from the general standpoint, the above method is combined with surgical treatment. The object in this, as in any form of treatment of laryngeal tuberculosis, may be summed up in the one word, *fibrosis*.

Some of the leading exponents of the surgical treatment of laryngeal tuberculosis are Arnoldson, Bar, Gruenwald, Lockard, Blumenthal, Bourack, Imhofer, Bezold, Gleitsman, Heryng, Dennis, Krause, Levy, M. Schmidt, Mermod, and Dean.

As a rule, when the diagnosis of laryngeal tuberculosis is made, local applications are first tried, lactic acid, 50 per cent, being applied to the larynx daily. If there develops a small infiltration of the vocal angle or the interarytenoid space, the cautery is tried, repeated every fortnight. The local applications are continued as before. If the infiltration does not yield to this treatment, the infiltrated area is curetted. If the infiltration now subsides, the cautery is resumed; if not, the curette is again used in two weeks.

If there is a tuberculoma in the interarytenoid space, or a well-circumscribed tuberculoma of the false cords, or a small tuberculoma or ulcer on the true cords, it is removed by the laryngeal forceps. If there is an interarytenoid tuberculoma, in addition to the excision, the base is curetted. Following this the cautery is used, or the curette, the choice being dependent upon the return of infiltration or tumor. Tuberculomas may require several excisions, but as a rule two or three excisions bring them down to the point where they can be controlled by other methods.

If the local application of lactic acid does not seem to be causing the lesion to fibrose, a change is made to formalin, usually one-per-cent solution. It must be emphasized that the success of treatment is based upon constant observation and a prompt change of treatment when change is indicated.

The results obtained in the treatment of laryngeal tuberculosis have, on the whole, been gratifying. The fact that many cases of tuberculosis have a better result in the larynx than they do in the pulmonary lesion shows very markedly the efficacy of the treatment. When one recalls that less than twenty-five years ago the presence of

a laryngeal tuberculosis was considered a death-warrant, one may be pardoned for showing considerable optimism.

All of his cases received the regular routine treatment—sanatorium care, rest of voice, steam inhalations, and the local application of lactic acid or formalin as indicated. Forty-one cases received this routine treatment only, while 81 cases received combined routine and surgical treatment. Amputation of the epiglottis was done in 17 cases with good results. Injection of the superior laryngeal nerve was done in 13 cases. It was usually found necessary to reinject about once a week, although some cases were relieved of pain by a single injection. Curettement alone was used in 6 cases; cautery alone in 20; and combined curettement and cautery in 35 cases. In these cases 111 curettements were done and 213 cauteries. All the amputations of the epiglottis and curettements were done by the suspension method; as were also a majority of the cauteries. Using this method, he feels that the treatment is more accurate and thorough.

In his discussion of the treatment he has considered only the developed laryngeal lesion. Prophylactic treatment, which would mean the keeping of the nose, throat, and general system in the best possible condition, the non-use of alcohol, tobacco, etc., will not be considered. Neither does he discuss the effect of climate or sea-trips, as these come in the field of the internist. Heliotherapy and treatment of the larynx with the various electric rays he does not discuss.

In the treatment of the laryngeal lesion, three conditions are important: time, continued observation, and coöperation of the patient. Time is needed in order to obtain results. Healing is a slow process usually, and the patient must know that it will be a long pull for him. Some cases may require observation and treatment for two years or more. Continual observation is necessary in order that the mode of treatment may be changed if the patient is not doing well. This is true of the surgical methods, as well as of the local applications. Coöperation of the patient is absolutely essential to good results. If the patient is not willing to do his or her part by careful regulation of the mode of life, rest of voice or following whatever treatment is prescribed, there is not much probability of cure.

A Case of Frohlich's Syndrome Following Injury to the Sella Turcica.

HENDRY, in the *Glasgow Medical Journal* for September, 1921, states that having had very poor success with the oral administration of extract of pituitary gland—the periods had indeed reappeared in diminished amount, but the adiposity was still very distressing to the patient—and while waiting for another preparation, he tried the effect of hypodermic injections of pituitrin. On physiological grounds one could hardly expect this to be helpful, as it is obtained from the posterior lobe, while the dystrophia is associated specially with a lesion of the anterior lobe. These injections produced no effect.

Five months ago he commenced the hypodermic injection of 1 cc of Parke, Davis & Company's antuitrin (or extract of the anterior lobe), at first twice weekly but recently only once weekly.

Originally he intended to administer the drug at much more frequent intervals, but the patient has not been able to attend for treatment any oftener than he has indicated. It would appear that the action of this drug extends over fairly long periods.

Her condition has improved very greatly. She feels herself much brighter; her interest in affairs is greater; she is less drowsy. She is convinced, almost against her own will, that she is losing weight. Six weeks ago she weighed 11 st. 10 lb.; the next week she weighed 10 st. 12½ lb., representing a weekly loss of over 2 pounds. She said her appetite and her food intake were just as usual. On testing her carbohydrate tolerance he found that with only 120 grms. of glucose she has a marked glycosuria as against a tolerance of 300 grms. nine months ago.

The special interest of this case is the association of Fröhlich's syndrome with an actual damage to the sella turcica. The association of the syndrome with congenital abnormalities or neoplasms is much more common.

In conclusion he wishes to draw attention to the special efficacy, in this case, of the hypodermic administration of the extract of the anterior lobe of the pituitary gland (antuitrin) as compared with the oral administration of the extract of the whole gland.

Luminal Sodium in Epilepsy.

Fox, in the *Lancet* of September 10, 1921, states that luminal was first tried in Germany in 1912, and has been fairly widely used, but he has not come across any record of the results obtained from it in England.

Luminal is phenylethylmalonylurea, or a derivative of veronal in which one of the ethyl groups is replaced by a phenyl radicle. Luminal sodium is a soluble derivative of luminal, and he has given it in solution, with hot milk or water, in doses of 1 to 2 grains once a day, usually at bedtime. The dosage is small as compared with that of Continental observers, who consider that three to four and a half grains can safely be given to adults over prolonged periods, provided that the patients are under adequate supervision. For the purposes of investigation 16 cases of ordinary epilepsy in children or adolescents were chosen. The patients were all liable to major attacks at fairly regular intervals, and none showed signs of marked mental defect or deterioration. It is essential to confine statistical investigation to patients whose fits show a regular incidence, unless very long periods of time are under review. Most of the patients were taking bromide when the luminal was started, and the daily dose, which in no case exceeded 30 grains, was continued. This course was no doubt open to some objection, but had it not been followed it would have been impossible to say whether any modification of the fit incidence was due to deprivation of bromide or to the luminal sodium. In this connection it is perhaps worth mentioning that Fox has known stoppage of bromide to be followed by a considerable lessening in the number of fits. All the patients were under the continuous supervision, both by day and night, of experienced nurses or attendants, so that the fit statistics should be complete.

Attention may be particularly called to two points in the figures shown. In the first place there is a marked reduction in the fit incidence in every case. This uniformity of reaction to the drug places it, he believes, in a category apart from other antiepileptic remedies. He has drawn up and published elsewhere similar tables dealing with the effects of belladonna, digitalis, and borax upon epilepsy, and they show no such uniformity of reaction. Borax, indeed, is the only one of the three which appears, when the figures are studied in bulk, to have any effect at all in the reduction of fit incidence. Various statistics of the fit incidence under the influence of bromide have also been published, but he has seen none with beneficial results so uniform as in his own table. This point is worth stressing, because it is a matter of common knowledge that marked benefit, or even a complete arrest of fits, may follow the adoption of any new line of treatment, therapeutic or dietetic, or from a chance change in the environment of any individual patient. Secondly, the considerable increase in weight that occurred in almost every case can be no mere coincidence. The average increase of the 16 cases works out at just under 5 pounds, and it will be noted that only in one case is a loss of weight recorded.

So much for the advantages of the drug. Are there any drawbacks to its use? Careful observation was made of the mental and physical conditions of all the patients. In no case was complaint made of headache or abdominal pain; nor were there any acute outbursts of excitement such as have been recorded by Continental observers. In 5 of the 16 cases the general mental condition

of the patients was apparently unchanged; in 3 the patients were reported as rather more irritable than formerly; while in 4 they were evidently more cheerful and alert. One case, a girl of fifteen, has become distinctly more dull since taking luminal sodium; her speech is hesitating and she appears to have trouble in finding her words. It is to be noted that her fit record shows less improvement than that of any of the other patients, and that her increase in weight is correspondingly small. Two boys, aged thirteen and eleven, became sleepy after taking the drug for a few days. In both cases the dose was probably too large, and improvement followed on its reduction. Finally in the fourth month of administration one boy, aged twelve, became very dull and lethargic, and could only with difficulty be persuaded to eat his food. The drug was stopped, and the boy began to get back to his normal condition some days later; but as he had an exactly similar attack some time ago it does not seem reasonable to ascribe his condition to the luminal sodium.

As in the case of other drugs, luminal sodium seems to give best results in cases liable to major epileptic attacks; cases which suffer from momentary losses of consciousness, or from periodic short attacks of altered consciousness with automatism, are notoriously inaccessible to drug treatment. Nevertheless there is recorded a diminution of momentary attacks in three of the patients in his table who were liable to them; and one of the most satisfactory cases Fox has had is that of a boy aged nine who was liable to very frequent psychic attacks with automatic movements, the number and duration of whose attacks have been very greatly diminished by three months of luminal treatment, and he has become, as a consequence, very much brighter mentally.

The modern view of the psychogenetic origin of epilepsy has led some writers to discount the value of any treatment directed to reducing the fit incidence or arresting the fits. Fits are said to be protective reactions away from an environment to which the epileptic, with his egocentric sensitive temperament, cannot adapt himself, and to stop fits is to court further mental trouble. He has seen mental disturbance follow the sudden cessation of fits in an old-standing case of epilepsy, but more commonly the patient becomes more alert and cheerful when his fits stop, and Fox has no fear that in using a drug that will arrest fits we are doing the patient any disservice, provided that we are satisfied that the drug itself has no prejudicial effect upon him. It is, of course, not claimed that luminal sodium, or any other drug, has any curative effect upon the disease; at best it only arrests or lessens the frequency of the convulsive attacks.

Some Uses and Doses of Hypnotics.

WYATT-SMITH, in *The Practitioner* for September, 1921, states that he does not believe there is any danger of producing an addiction to hypnotic drugs by their intelligent medical use.

Opium and its products should never be regarded as hypnotics.

The bromides are of little practical use as such. Bicarbonate of soda and night-socks have far better right to the title.

Chloral hydrate is perhaps the most generally useful of the cheaper hypnotics; and is, probably, not very dangerous even in cases of fatty heart.

Paraldehyde is the best mere nightcap in mild cases and is useful in a dose up to half an ounce with the first dose of some other hypnotic, such as sulphonal, to anticipate its coming into action.

Sulphonal is, except for its high price, the best of our hypnotics in that it is also a decided mental sedative. It appears to be quite safe in doses up to at least a drachm a day, given in individual doses of 30 grains night and morning, or, better, of 20 grains three times daily.

Hyoscine is our strongest agent in a hypnotic emergency, and is quite safe up to 1/50th and probably up to 1/33d of a grain, hypodermically. It should be given

an extended trial in acute delirious mania and in delirium tremens.

[We regard the above doses of sulphonal as too large for safety.—ED.]

The Treatment of Three Hundred Cases of Sciatica.

LESZYNSKY, in the *New York State Journal of Medicine* for September, 1921, states that after the diagnosis has been definitely established, no matter what the etiological factors may be, the most essential features in the treatment are rest of limb and immediate relief of the pain. This may be accomplished by keeping the patient in bed lying on a mattress that is even and does not sink in the middle. In mild acute cases, thoroughly emptying the lower bowel, counter-irritation by friction with oil of gaultheria, the application of heat over the seat of the pain, either by a hot-water bag, electric light lamp, or a moist electric pad, etc., may suffice. The administration of codeine and phenacetine, aspirin, sodium salicylate, salol and phenacetine, or tolysin will often prove serviceable.

In severe cases a hot saline rectal irrigation for ten or fifteen minutes followed by a suppository of opium and belladonna will afford prompt temporary relief. Later, superficial linear cauterization or the application of the galvanic or high-frequency currents is useful.

Sacroiliac joint trouble may simulate true sciatica or be one of its complications. In doubtful cases, fixation of the joint by the application of strips of adhesive plaster will serve as a valuable therapeutic test by promptly relieving or diminishing the pain.

In a paper published nine years ago he called attention of the medical profession to the value of saline perineural injections in the treatment of sciatica. At that time he reported twenty-five cases treated by this method, and stated that "perineural infiltration of physiological salt solution at the sciatic nerve, when properly performed, is a valuable remedy for the relief of sciatic pain whether acute or chronic." In another paper read two years later further observations were recorded in one hundred and thirty-five additional cases, representing in all about four hundred and eighty injections in one hundred and sixty patients.

Since that time he has carried out the injection treatment in over one hundred and fifty additional cases, making a total of three hundred and ten cases during the last nine years. Neither complications nor unpleasant symptoms have been encountered as a result of this procedure, which under proper technique and strict asepsis is practically harmless.

The reaction of the patient cannot be determined in advance with any degree of precision or certainty. Some patients have been promptly relieved after a single injection, even when the sciatic pain had lasted for several years. But he emphasizes the fact that in the majority of patients from two to five or six injections are required extending over a period of as many weeks. The average number is three.

Unfortunately, this has not been well understood, although it has been repeatedly explained to the patient as well as to his or her physician.

In many instances, in his experience, if the patient is not completely relieved after the first injection, further treatment is discontinued and the method unjustly abandoned and discredited. This is commonly the fault of physicians who either have a nebulous idea of its technique, or have not taken the trouble to familiarize themselves with the facts. Others have looked upon the injection treatment as a *dernier ressort,* which is a mistaken conception as to its indications.

During the last two years the writer has also utilized the method of injecting saline solution with or without novocaine into the sacral canal, according to the technique originated by Cathelin in 1913. He has given about fifty of these injections. In the acute stage and particularly in the radicular form this is at times more efficacious than perineural infiltration. He has also made use of both methods alternately in the same patient with beneficial results.

He does not recommend this treatment

in every case, for many patients recover under the customary measures. In subacute and chronic intractable cases, however, it has proved in his experience to be the most satisfactory acquisition to our therapeutic armamentarium that has yet been devised. He therefore takes this opportunity to reiterate that "from an economic standpoint it is superior to any other form of treatment, for, in the majority of instances, the pain subsides rapidly, and the sufferer is soon enabled to resume his customary vocation."

Many striking illustrations have been witnessed and reported. It has been a common experience to see men or women with sciatica, who have been incapacitated for many months without obtaining relief from the usual forms of treatment, rapidly restored to activity by this method.

It is unnecessary to further dilate upon the inaccuracy of the statement that all sciaticas are caused by joint disease.

The fact that many of these patients in whom the sciatica had lasted a long time have been rapidly and permanently cured by a single injection is ample refutation of such a preposterous orthopedic dictum. He does not, however, wish to belittle the fact now universally accepted, but not sufficiently recognized, that disease of the pelvic or lumbosacral joints is often the cause of sciatic pain.

Surgical and Genito-Urinary Therapeutics

End Results in Cancer of the Breast.

GREENOUGH and SIMMONS (*Boston Medical and Surgical Journal*, Sept. 1, 1921), on the basis of the need of a generally accepted form for the report of end results of operation for cancer, have suggested and carried out the following procedure:

A definite period of time has been selected ending at least three years prior to the report, and all of the cases entered in the hospital records under the given diagnosis have been investigated.

No case has been accepted as cancer without proof by pathological examination, or subsequent recurrence, or autopsy.

Cases which have survived, at last report, only a portion of the necessary three-year period are eliminated as inconclusive.

Cases not traced at all after discharge from the hospital, and not appearing in the mortality statistics of their place of residence, are eliminated as inconclusive.

All cases fulfilling the above requirements are published and counted in the statistics, with such subdivision into radical and palliative operations as may seem expedient.

It is the hope of the writers that this standard requirement may be adopted by others for similar reports. A writer who counts as successful cases those which have survived a period of less than the arbitrary three-year standard, or who accepts the clinical diagnosis of cancer without microscopic examination of the specimen, cannot in justice ask to have his statistics accepted for comparison with those of surgeons who exercise a more careful scrutiny. It is well said by Halsted: "It is especially true of breast cancer that the surgeon interested in furnishing the best statistics may in perfectly honorable ways provide them."

The obvious solution of this difficulty is to publish all cases which fulfil the present conditions and allow the reader to draw his own conclusions. If one surgeon reports 100 cases, of which 25 are palliative and 75 radical operations, his statistics for radical operations may well be expected to be inferior to those of the surgeon who performs 50 palliative and 50 radical operations in the same total number of cases. Without these figures, however, the opportunity for comparison is lost, and the two sets of statistics apparently meet on equal terms.

At the meeting of the American Surgical Association in May, 1920, a committee was appointed to report upon the value of *x*-rays and radium in the treatment of malignant disease. In considering the methods of obtaining data on which to make a report this committee at once encountered the difficulty above referred to, namely, the lack of an accepted standard for the reporting of the end-results of treatment of cases of cancer. Since the method adopted in the first Massachusetts General Hospital paper on cancer of the breast, and subsequently followed in the second paper on cancer of the mouth, has proved to be satisfactory, the writers would again present this method as a standard suitable for adoption by the profession at large, and as a further example of its value they would here report, briefly, a series of cases of cancer of the breast which were operated upon at the Massachusetts General Hospital between the dates of August 1, 1911, and April 1, 1914. During this period, in accordance with the policy of the hospital, assignments of special cases for study were made to different members of the hospital staff, and to the writers were assigned all cases of tumors and diseases of the breast. By following the method adopted in the report of the first series of cases of cancer of the breast, a fair comparison is possible of the results in the second series. It is not too much to say that a similar comparison would be directly possible with the result in other clinics if this method of reporting cases were universally employed.

The scheme for the reporting of end-results of treatment of carcinoma may be summarized as follows:

A. Record all cases entering surgical wards with the specified diagnosis during period selected.

B. Eliminate all reëntries. (No single case should appear twice in the report.)

C. Eliminate all cases recurrent after previous operation in hospital or elsewhere; these are not cases of primary attempt to cure.

D. Deducting B+C from A we have the number of cases of cancer available for study of operability, mortality, and other operative statistics. These cases may then be subdivided as follows:

E. Cases of radical operation.

F. Cases of palliative operation.

G. No operation advised or performed.

H. Operative deaths.

I. Operative mortality: H÷E+F.

J. Operability (radical operations): E÷D.

K. Operability (all operations): E+F ÷D.

For the study of end-results of treatment certain cases included in D are of no value and should be deducted, viz.:

L. Cases not proved to be cancer, either by pathological examination of tissue, or recurrence, or autopsy.

M. Cases untraced after leaving hospital for required interval of time—three years; five years.

N. Cases that have died of other diseases within the required interval of time; and without evidence of recurrence.

O. The remaining cases, after deducting L, M and N from D, are available for study of end-results, as follows:

P. Radical operations.

Q. Palliative operations.

R. No operation.

S. Number of cases alive without recurrence (3 years; 5 years).

T. Number of cases died (over 3 years or over 5 years) without recurrence.

U. Number of 3-year or 5-year "cures." All operations. (S÷T.)

V. Number of 3-year or 5-year "cures." Radical operations.

W. Percentage of 3-year or 5-year "cures." All operations. (U÷P+Q.)

X. Percentage of 3-year or 5-year "cures." Radical operations. (B÷P.)

The authors record from August 1, 1911, to April 1, 1914, that 115 cases of cancer of the breast entered the wards of the Massachusetts General Hospital. Eight of these cases were reëntries of patients already once listed in the series, and four were cases of cancer recurrent after a

primary operation performed elsewhere, or in the hospital prior to the date of this investigation. Deducting these 12 cases, there remain 103 cases of primary cancer of the breast for study; 74 were subjected to radical operation and attempt at cure; 20 were given a palliative operation; and in 9 cases operation was not advised or was refused. During the period mentioned above 178 cases of disease of the breast came under consideration. From this series errors in diagnosis were made in 10 cases; in two cases a diagnosis was made of cystic disease which proved to be carcinoma. Two cases diagnosed as carcinoma proved to be cystic. In two cases fibroepithelial tumors were diagnosed as cancer. In two cases the diagnosis of cancer should have been that of round-cell sarcoma.

The operation performed was as follows:

The "Rodman" transverse axillary incision was used, but the typical "Rodman" operation was modified to the extent that the two incisions encircling the breast were carried into the axillary incision at a point from two to three inches apart, and beveled in such a way that the skin removed with the tumor is, roughly, of an arrow-head shape. This modification has been introduced with the design of procuring more complete security for exposing the lymphatics along the lower border of the pectoral muscle, below the axillary region. The lymphatics in this area are apt to be involved early in the disease, and it is a frequent site for early skin involvement in advanced inoperable cases.

The transverse incision can be carried across the mid-clavicular line, and as high into the neck as may be desired, in case a supraclavicular dissection is to be performed. In 14 cases of this series the supraclavicular dissection was done as part of the primary operation, and in two cases as a secondary measure. In no case in which disease existed above the clavicle was a successful result obtained, and the supraclavicular dissection is now rarely performed; cases with disease in this region are considered beyond operative relief.

The anterior and posterior flaps marked out by the arrow-head incision are dissected back to the clavicle and sternum in front, and to the latissimus dorsi behind, leaving all of the fat attached to the deep fascia. The outer side of the axillary incision is also dissected back to the humeral insertion of the pectoralis major, leaving the subcutaneous fat *in situ*. Fat and deep fascia are then removed to a point near the middle line of the clavicle. The pectoralis major is divided near its insertion, and all that portion arising in front of the middle line of the clavicle is removed, exposing the axillary contents. Dissection is then begun on the vein in the lower part of the axilla, and sweeping toward the chest wall all the axillary structures are removed, with the exception of the axillary artery and vein, the brachial plexus, the subscapular and posterior circumflex arteries, and the long thoracic nerve.

When the margin of the pectoralis minor is reached this muscle is divided close to its insertion, and the dissection is carried to the costocoracoid membrane, special attention being given to the removal of the lymphatics which pass under the clavicle in front of the subclavian vein. As fast as the axilla is cleared the dissected area is packed off with gauze, wrung out of hot salt solution. The breast, with its overlying skin, the two pectoral muscles, the axillary contents, and the deep fascia, to the limits of the incision, namely, from the middle of the sternum to the latissimus muscle, and from the clavicle to the rib margin, is then removed in one piece, the axillary tissues being kept covered with gauze, and the whole mass being swept toward the epigastrium. The fascia over the upper portions of the right and left rectus muscles, and the space between them, is removed as the last step of the operation.

Such a wound cannot always be closed by tension or by flaps. The tissues of different individuals vary in their ability to stand tension. Where the wound is not readily closed the defect is allowed to remain and is closed with a Thiersch graft from two to three weeks after operation.

Twenty cases in this series were sub-

jected to palliative operations. In 11 the complete operation was performed in cases of advanced cancer where there appeared before operation to be little, if any, hope of cure, but where it was desired to give to the patient every chance of relief which might be possible. In all of these cases, at the end of the operation, it appeared certain that cancer tissue still remained that the operation could not cure, and, in fact, in 10 of these cases which were traced to an end-result no benefit from the operation could be discovered.

In nine cases an incomplete operation was performed, varying from a hasty removal of an ulcerated or bleeding tumor, under ether, to operations of even less extent under gas-oxygen or local anesthesia. In one of these cases, however, an adenocarcinoma removed with local anesthesia in a patient suffering from pyonephrosis, a successful result was unexpectedly obtained, and the patient reports free from disease at an interval of eight years after operation.

In addition to the nine incomplete operations performed as purely palliative measures, six cases had less than the complete operation done in the attempt to cure the disease. These were cases of supposed low-grade malignancy in which it was believed that the performance of the complete operation was not necessary. They include two cases of colloid carcinoma in which the pectoral muscles were not removed, both five-year "cures;" three cases of adenocarcinoma in which the muscles were not removed; two of these cases were "cures" and the third developed a recurrence in the sternum after three years, but with no local return of the disease. The sixth case was an error in diagnosis and was operated upon as cystic disease, but was discovered subsequently to be carcinoma. No further operation was possible in this case, and the results are unknown, as the patient cannot be traced.

In four cases an exploratory operation was performed, and the tumor was incised or tissue was excised for frozen section diagnosis, and the radical operation immediately completed on the establishment of the positive diagnosis. In all four of these cases the operation was successful in removing the disease, and the patients are now well. In contrast with this fact it should be stated that there were two cases in this series in which a preliminary local excision of a tumor of the breast was performed by a surgeon outside the hospital, the tissue submitted to a pathologist for examination, and a report of cancer received. These two patients were at once sent in for radical operation, which was performed within two weeks. In both cases a very extensive operation was performed, including supraclavicular dissection, but without success—one patient dying within one year with local recurrence and the other with spinal recurrence in thirty months. This is in accord with general experience, and emphasizes again the extreme danger in local excision of suspicious tumors of the breast unless facilities are available for frozen section diagnosis and immediate completion of the radical operation when cancer is disclosed.

Sepsis occurred in five of the 94 cases submitted to operation. Two of these were cases of erysipelas, and three were cases of low-grade infection occurring late in a wound still draining serum from the axillary space. In two cases there was a femoral phlebitis, and in three the axillary vein became thrombosed, but without obvious infection in the wound. Two patients showed symptoms of bronchitis and one a definite bronchopneumonia, but all three made a satisfactory recovery. There were no deaths. In 23 cases the amount of skin removed made necessary a Thiersch graft to close the wound. Nineteen of these grafts were successful, and four were failures. The grafts were all done as secondary operations two weeks or more after the primary operation, it being the authors' belief that a more mobile and less unsightly scar is thus produced.

From the total number of cases (103) of primary cancer of the breast, eight have to be discarded in consideration of end-results on account of insufficient data; five of these

cases (two radical and three palliative operations) remain untraced after their departure from the hospital, and three cases of radical operation died of other diseases at periods of twelve, twenty-four, and forty-eight months, respectively, after operation, without evidence of recurrence but within the arbitrary time limit of five years adopted for this series of cases. We have, therefore, 95 cases available for study of the end-results, of which there were 69 attempts at cure, 17 palliative operations, and 9 in which no operation was performed.

Before operation the attempt was made to estimate roughly the prognosis of every case in this series. After operation the conditions found were recorded, and in the light of these facts the prognosis was revised. From these data it was possible to subdivide the 95 traced cases into five classes, as follows:

Class 1. Early favorable cases with little or no enlargement of the axillary glands (including the four cases in which an exploratory incision was necessary for a diagnosis). In this group there were 14 cases, with 10 five-year "cures," or 71 per cent. It is to be noted that in spite of the fact that enlarged glands could not be demonstrated before operation, the pathological examination showed cancer in the glands removed in four cases of this group, and in two of the four a cure was not obtained.

Class 2. In this group moderately favorable cases were included in which definite but slight enlargement of the axillary lymph nodes was observed. There were 26 cases in this group, with 9 "cures," or 35 per cent.

Class 3. Average cases. Positive signs of extension of the disease. Large tumors, adherent to skin or approaching ulceration. Marked axillary involvement. Twenty-nine cases, 3 "cures," or 10 per cent.

Class 4. Advanced cases. Palliative operations. Evidence of possible supraclavicular extension, or internal metastases, as of lung or spine. Seventeen cases, one "cure," or 5 per cent.

Class 5. Hopeless cases. No operation advised. Nine cases; no cures.

The Treatment of Varicocele.

ALLISON *(Southern Medicine and Surgery,* August, 1921) basing his practice on the report of 300 cases operated on at the Naval Hospital, New York, describes an operation as usually performed.

He remains somewhat optimistic in regard to the prognosis and enthusiastic in the performance of this minor surgical procedure. This is suggested by the number of his reported cases. He states that when varicocele is present, and even granting the symptoms to be partly subjective, the operation should be performed, depending upon the discomfort experienced by the patient. He states that atrophy of the testicle did not occur in a single case of his series.

Diathermy in Dermatology.

SIBLEY *(Urologic and Cutaneous Review,* September, 1921) reports a number of successful cases, holding that the process is not only useful for destroying small superficial pathological skin conditions such as nevi and tumors, but it can be used to supersede operations of a more drastic nature for the satisfactory removal of growths, benign or malignant, of the skin or mucous membranes, which formerly would have been excised by the knife.

In these cases the method usually adopted has been to place the hand or foot in a basin of warm saline solution with one electrode placed in this and the other applied over layers of lint soaked in saline solution and firmly bandaged to the limb above the seat of the lesion. The current is gradually turned on and increased as long as the patient does not complain of discomfort, when it should be immediately diminished. This application lasts for fifteen to thirty minutes a treatment, and may be repeated twice daily or less frequently according to circumstances. After each treatment the parts should be appropriately massaged, and then well wrapped up and kept warm as long as possible.

This condition also applies to the treat-

ment of gonorrhea both of the male uretha and female cervix, in which cases a zinc sound is inserted into the passages and attached to the diathermy apparatus, and then the current very gently turned on and gradually increased until the patient complains of discomfort. Gonococci are easily destroyed by heat, as a temperature of about 103° F. renders them inert.

With regard to surgical diathermy or fulguration, to all intents and purposes this is a process of cauterization, but really one which is much less painful than the actual cautery. A local anesthetic is never very satisfactory because it is difficult to do away with the shock from the electric current is a costly one, and requires the prodisturbing to the patient as the actual burning process.

Two sets of active electrodes are in use, the one blunt-pointed steel, the other flat steel discs of various sizes. For complete cauterization the pointed one is in general use, such as in cases of lupus vulgaris, rodent ulcer, etc. For partial, when only a smart reaction of the tissues is required, as in lupus erythematosus, one of the flat electrodes has been applied.

The apparatus for generating the currents is a costly one, and requires the production of a high-frequency current which reverses its direction at the rate of about 1,000,000 times each second.

He summarizes his article as follows: The advantages generally claimed for this form of cauterization over operation by the surgeon's knife are:

When the electrode is properly selected, neither too sharp nor too pointed, extensive operations may be performed without appreciable immediate hemorrhage. Secondary hemorrhage may of course occur later on, when the slough begins to separate, and must be carefully watched for in all extensive cases, or those in especially vascular areas.

If the operation is satisfactorily performed all the tissues in the immediate neighborhood of the seat of the electrode are completely destroyed, and so prevent the possibility of secondary growth by cell implantation, nor is there any risk of spreading the disease by the instrument of operation.

Sterilization of the operation area. The process of destruction is so complete that all pathogenic organisms which come in contact with the instrument will be effectively destroyed.

Destruction of tissues can be produced at some appreciable distance from the active electrode. The extent of the area of destruction depends upon the form and size of the electrode, the strength and direction of the current, and the nature of the tissues.

The shock is considerably less than after other surgical procedures.

There is a complete coagulation of all vascular structures, including the lymphatics in the neighborhood, and so septic absorption is much less likely to take place.

The operation being more or less bloodless, it is much easier for the surgeon to see what he is doing.

The scar resulting from the operation is usually denser and firmer than after cutting operations, and thus acts as a barrier to the extension of malignant growths.

It is often possible to operate on subjects considered too old or feeble for other methods, the electric current acting as a stimulant to the patient.

If necessary, operations may be performed at several sittings, and in the event of recurrence of the growth further applications may easily be made.

Fulguration as a means of cauterization in many dermatological conditions is a very useful and convenient method. It is an aseptic and rapid treatment, as only a few seconds' application is necessary for most superficial lesions, and a large number of patients can be treated in a very short space of time. With the exception of those cases of rodent ulcers and lupus which were septic before operation, in no case did any sepsis arise as the result of treatment. The author has found this method useful for puncturing acne pustules, also for opening small boils and abscesses.

The discomfort or pain during the few seconds of application was easily borne,

even by nervous or delicate subjects, many of whom were children.

Pain was never experienced afterwards. The moment the operation was completed all discomfort ceased spontaneously. The lesions rapidly dried up without any secondary inflammation, nor, with the exception of those with previous ulceration, were any dressings necessary. The infirm or debilitated were also treated without any evidence of shock, either immediate or remote; in fact the electric current appeared to act as a stimulant rather than as a depressant. Lesions in epileptics were among those operated on; a fit was never experienced as the result of the treatment.

Tuberculosis and Syphilis of the Lungs.

The universal employment of the Wassermann reaction has revealed the striking frequency of syphilitic infection in persons suffering from tuberculosis. In ten years of prison service Tedeschi found that 70 per cent of the cases of pulmonary tuberculosis had developed upon a luetic soil. Among 346 tuberculous inmates of Boucicaut Hospital, 19 per cent (64) gave a positive Wassermann reaction, although only 3 per cent (10) acknowledged a syphilitic infection or showed any signs of it. Among 116 patients at the Brompton Hospital with pulmonary tuberculosis selected at random by Inman, only 5 per cent (6) gave a positive Wassermann reaction.

Potter *(Am. Jour. Med. Sci.)* cites a number of instances in which salvarsan has been used in such cases, and concludes that the prompt employment of salvarsan or neosalvarsan is indicated in latent chronic or moderately active tuberculosis: (*a*) As soon as the nature of an added infection is diagnosed with reasonable probability to be syphilitic; (*b*) whenever the history, signs, or symptoms strongly suggest a previous luetic infection, particularly if such a patient is not improving upon the usually successful hygienic and climatic treatment for tuberculosis; but (*c*) active tuberculosis, acute tuberculosis, and diffuse miliary tuberculosis are usually definite contraindications to the use of these new arsenic preparations, though in both the first two named groups there will be found many luetic patients upon whom a small dose of salvarsan may well be tried and, unless followed by untoward effects, cautiously repeated in gradually increasing doses.

When tuberculosis infects, or becomes active in, a patient with secondary, tertiary, or even latent syphilis, the careful employment of one of these drugs is also indicated.

The more active the tuberculosis, the smaller should be the initial dose; the slower its increase, the less frequent the interval, and the greater care and watchfulness required.

Tuberculin-like focal reactions which may follow the administration of these remedies should be carefully watched for, and, if present, the location, intensity, and character will frequently guide in the selection of the next appropriate dose or interval.

Watkins *(Am. J. Roentgen.)* writes that tuberculosis and syphilis may occur simultaneously in the same lung, each producing its own lesions, which frequently can be distinguished on the radiograph.

The two diseases may also occur as a true symbiosis. This peculiar condition was first brought to Watkins's attention by the publication of the researches of Dr. Carl Spengler, of Davos, in whose papers he found an adequate explanation for the brilliant therapeutic results of Wright in treating tuberculosis with injections of mercury salts. The term symbiosis carries with it tacit denial of the supposed antagonism between the organisms of tuberculosis and syphilis, for which there is no biological or clinical evidence. Symbiosis occurs when syphilis prepares the soil either by active inflammatory destruction of lung tissue or by a slow, mild inflammatory congestion. The localization of tubercle bacilli, thus influenced by syphilis, is more wide-spread, and we find the lesions and shadows not only in the upper lobes, but also in the bases.

A symbiosis is also represented by the effects of acquired syphilis on a latent

tuberculosis. Here, as Dieulafoy expresses it, the syphilitic virus "hatches the tubercle bacilli and sows them broadcast." A widespread distribution of tuberculosis may be produced by the latent as well as the active form of syphilis. However, active syphilis, when grafted upon a preceding tuberculosis, results in a very malignant disease, which may not be true when tuberculosis is implanted in a lung where latent syphilis already exists. It is conceivable that a well-established fibrotic tendency produced by a long-standing latent syphilis of the lungs will choke a secondary infection. This, however, is tissue resistance and not bacterial antagonism, a distinction which is of vital importance in treatment.

When the tuberculous process is under the influence of a symbiotic syphilis, the characteristics of neither infection will be preserved. Dieulafoy cites an instance of a caseous gumma whose outer rind was thickly studded with tuberculomas about the size of peas; the shadow of such a lesion naturally would be very atypical. We may find areas where the typical tuberculous shadows are preserved; elsewhere there will be groups of small, rounded, or irregular densities, representing small consolidations without detectable relation to bronchial stems. Where the syphilitic areas have been invaded by tuberculosis, or where the encapsulated tubercle is broken down and the bacilli disseminated by the effects of syphilis, we cannot expect to find any typical arrangement of shadow. The absence of infected cavities, the confluence of small consolidations along the heart border, large hilus masses, diffuse fibrosis, should suggest syphilitic rather than pyogenic double infection.

Watkins emphasizes the importance of the combination from the therapeutic point of view as follows:

First, in the treatment of systematic lues it is important to know whether the lungs are involved, since a Herxheimer reaction in the lungs may be serious.

Second, it is doubly important, in tuberculosis, to ascertain whether the patient combats this comparatively benign single infection, or whether a sinister combination with active syphilis must be treated.

Third, it may be triply important not to disturb the fibrotic changes of latent syphilis by arsenical treatment, if the tendency of this fibrosis is to arrest the tuberculosis.—*Urologic and Cutaneous Review,* September, 1921.

Treatment of Nerve Injuries.

Ney *(The Military Surgeon,* September, 1921) states that the surgical treatment of nerve injuries consists almost entirely in the removal of scar tissue, which interferes with regeneration or the physiological activity of a nerve; but after a nerve is freed from scar tissue or its ends sutured, the course of regeneration has just begun, and the treatment, from this period, falls almost entirely in the domain of physiotherapeutics.

We may divide the period of nerve regeneration into three definite clinical stages, and a consideration of each stage will suggest the therapeutic procedures to be instituted:

The first stage constitutes the period during which the regenerating neuraxon is growing from the point of its division to the muscle, with the reëstablishment of its neuromuscular junction.

The second stage, the interim after the establishment of this neuromuscular junction (the restitution of the sense of muscle function), until the appearance of voluntary muscular contractions.

The third stage, from the first appearance of voluntary motor power to the period of complete motor restoration.

The treatment during the first stage consists in maintaining nutrition through the stimulation of blood and lymph circulation, and the inhibition of fibrous transformation of muscular tissue; the prevention of muscle stretching or the formation of contractures; the prevention of fibrotic limitation of joint function.

The second stage, a continuation of the above treatment, with the addition of psychological treatment directed to the reestablishment of the power to transmit

volitional impulses through the regenerated nerve; the psychological direction of impulses for definite muscle movements; the development of power in the regenerating muscles; the reëstablishment of muscle coordination with the elimination of compensatory habit trick movements.

Vincent's Angina.

ELMENDORF *(The Military Surgeon,* September, 1921) states that in every case of Vincent's infection of the tonsil the gingival membrane should be regarded as the starting-point of the infection. If dark-field examinations or stained smears are made the infection will be found in the majority of cases. Every case of true Vincent's angina before being discharged should have an examination by a dental officer and active treatment started to eradicate the infection from the gums. So long as the gums harbor the infection relapses are nearly certain to occur on the tonsil.

It is also very important to recognize these cases at the start, as the treatment for follicular tonsillitis generally prescribed (such as gargles of Dobell's solution and swabs with argyrol or silver nitrate in 5-per-cent or 10-per-cent strength) in the author's experience had not had any beneficial effect.

Every case in which a smear or dark-field examination of material from the gums is reported as positive should be sent to a dental officer for active treatment, regardless of whether the patient has ever had any symptoms referable to the tonsil or gums. The treatment which has been found most effective is as follows:

Cases of Vincent's tonsillitis are isolated in bed. The treatment is started by giving a saline cathartic; sodium salicylate is administered four times daily; the ulcer is swabbed out twice daily with 5-per-cent chromic acid; the patient is required to gargle every half-hour with full-strength hydrogen peroxide so long as temperature and pain are present, and less often as the symptoms subside. Great care should be taken to introduce the swab (a wood applicator wound with cotton) to the full depth of the ulcer.

The majority of cases are free of fever in forty-eight hours and have no severe symptoms after four days. In a few cases it may be necessary to substitute for the 5-per-cent chomic acid a paste made of potassium permanganate crystals and water. The organisms appear to be very susceptible to the action of hydrogen peroxide, which should constitute a part of the local treatment in any case.

In order to eradicate the infection from the gums, dental treatment is imperative. The teeth are cleansed of all traces of tartar and calcareous deposits. The ulcerating surfaces on the gums are cleansed by applying hydrogen peroxide with cotton swabs and all loose tissue is removed. To the ulcers which have been so cleansed a solution of 5-per-cent chromic acid is applied. This is washed off with water in about ten minutes to prevent discoloration and destruction of the enamel. The application is made once every other day; on the alternate days a paste of potassium permanganate and water should be substituted.

The mouth is washed every half-hour during the acute stage with hydrogen peroxide, and the teeth are cleansed after each meal with a tooth-brush soaked in pure peroxide. A spray of compound tincture of benzoin may be used after treatment to relieve pain.

Careful sterilization of all mess kits and cooking utensils should be carried out after each meal. This should be done purely as a precautionary measure and should not be considered as a method of eradicating the infection. There are numerous ways common to soldiers of bringing about a trade in saliva, such as smoking a cigarette lighted by another man, using another's pipe, the ordinary droplet infection, and promiscuous spitting. These and many others are capable of spreading such an infection as this, which is commonly termed "trench mouth," but it is very important during the washing of mess kits not to

spread the infection from the utensils of one man to those of another by way of lukewarm wash water.

It has been the practice at the Convalescent Hospital to insist upon sterilization of all mess kits. This is accomplished by a series of three French kettles. The first two are filled with a strong solution of laundry soap kept at the boiling point at mess hour. The third kettle is filled with clear boiling water. These kettles are placed in line so that it is necessary for each soldier after emptying his refuse in a galvanized iron can to pass by each of these kettles before emerging from the line.

Bacteriological tests have been made by taking samples of the water during the time mess kits are being washed and swab cultures have been made from meat cans, cups, knives, forks and spoons, and inoculated immediately into bouillon. The tests have proven the system efficient, and it is strongly recommended for general use in the army.

Pseudotabes.

KOUINDJY *(New York Medical Journal,* Sept. 21, 1921) observes that pseudotabes is a pathological entity easily distinguished from true tabes, on account of its etiology and especially its course. According to Professor Dejerine and Dr. Thomas pseudotabetics are characterized by their tendency to complete cure, by tenderness on pressure of muscles, and by the absence of the Argyll-Robertson pupil. Further, they can be distinguished by the different topographical distribution of anesthesias, which here diminish from the distal end toward the root of a limb, whereas in tabes they always show a radicular distribution.

Professor Dejerine, who published his first two observations on pseudotabes in 1882, has termed this affection neurotabes or peripheral tabes, thus indicating the polyneuritic origin of the disease.

There are also varieties of pseudotabes which show at the same time medullary and peripheral lesions, such as in those due to diabetes. In the majority of cases pseudotabetics also present psychic disturbances in the form of phobias in addition to two or three signs of tabes, such as Romberg's sign, lightning pains and disturbances of sensation, or the loss of reflexes. The dominating obsession is the morbid fear of walking. Basiphobia is the psychic element characteristic of pseudotabetics.

It has been stated that the motor incoordination of pseudotabetics does not resemble the locomotor ataxia of Duchenne, of Boulogne. Nothing could be more inexact. Though in some cases of pseudotabes the motor incoördination approaches the type of polyneuritic ataxia, characterized particularly by "steppage," yet in the majority of cases it is, so to speak, a copy of the ataxia found in true tabes. The walk of pseudotabetics is precipitate, jerky, staggering, hesitating, and spasmodic in a fashion equal to that of a good many true tabetics. These manifestations show the closest resemblance in the case of a pseudotabetic whose symptoms suggest an early stage, or the first degree of locomotor ataxia.

The author concludes with the statement that pseudotabes is not as rare as has been assumed. It may be due to a number of different causes, such as intoxication, infection, and overwork.

Pseudotabes may also have a syphilitic origin.

The symptoms recall those of true tabes dorsalis. They are distinguished by the intensity of their manifestations and by their complete disappearance ultimately. It is characteristic of pseudotabetics to be cured completely in all instances. Pseudotabes is distinguished from tabes dorsalis by the evolution of the symptoms, by their rapid development, and by their customary curability. The treatment of election of pseudotabes must comprise treatment of the etiological cause and also symptomatic treatment. Physiotherapeutic treatment occupies a predominant place in the second instance. Thanks to the four physical agents, of which it is built up, this treatment renders great service in the therapeutics of pseudotabes, whatever the origin

of the disease. Among these four physical agents, reëducation must be considered the most rational measure, being calculated to combat at the same time both the motor disturbance of progression and the psychic state of pseudotabetics.

Subluxation of the Shoulder Downward.

COTTON (*Boston Medical and Surgical Journal,* Oct. 6, 1921) describes a lesion which he finds common, although comparatively unwritten—the subluxation downward in cases of injury; not from a single trauma, but from the weight of the arm made possible through gradual exhaustion of the muscles—primarily of the deltoid muscle.

The author has watched this thing for years, occurring in case after case as a complication of shoulder and arm injuries; neglected, it becomes a troublesome complication.

Many, evidently, of the cases ordinarily listed as circumflex paralysis belong in this group.

The type of case is of an uncomplicated fracture of the humerus in which the weight of the heavy and, perhaps, swollen arm, suspended—as in the routine treatment—by the wrist only, brings about a tiring-out of the supporting muscles and the gradual appearance of such a subluxation.

Now the facts seem to be if we have an injured arm treated with traction by the weight of the arm, or treated by any method that does less than carry the full weight of the arm, then if the muscles are not strong (eight of these nine cases were in women, nearly all forty to seventy years old), and if the arm is a heavy one, we may and often do get a stretching paralysis of the deltoid and supraspinatus muscles that lets the head of the humerus drop down. This is readily overlooked, but easily verified by finding a groove below the acromion to the outer side, often visible, always easily felt.

If nothing is done the condition passes on to one of helplessness and stiffness, at first glance not unlike that of subdeltoid bursitis, particularly like the form complicated with supraspinatus rupture.

Treatment, after recognition of the fact, consists of early massage and, just as soon as the main damage makes it practicable, exchange of traction for support, and effective support, of the whole arm. Unless too long a time has elapsed such support, with massage, gives a prompt result—relatively.

The most recent patient broke her humerus April 19, 1921, and was of necessity in traction until June 1, having cautious massage from May 10 on. Traction was abandoned June 1, and with support and massage and exercises she now (June 27, 1921) has a solid arm and pretty nearly normal shoulder function. This patient, though stout, is vigorous and only thirty-eight years old.

Older or less vigorous people need much longer.

These cases for a considerable time show not a trace of deltoid power, and several early cases showed definite electrical changes.

The cases reported and pictured date back five to seven years. All nine cases were seen in private practice. At the hospital—less fully followed through—there were many more similar cases.

Fractures of the Lower End of the Radius.

BENDIXEN *(International Journal of Surgery,* September, 1921), after a classification of these fractures, takes up the question of treatment, with the statement that in all injuries about the wrist an *x*-ray should be taken.

As for reduction, he states that there are many methods of reduction which may be used in reducing fractures of the base of the radius, but no one method is applicable to all cases. The reduction must bring the displaced and rotated fragment down into place. When it does the hand will lie laxly in a position of flexion if the forearm alone

is supported, and the silver-fork deformity will have disappeared.

Maintenance of reduction may be accomplished by the use of any of several forms of dressing. A gypsum splint molded to fit the dorsal or the flexor surface cannot be improved upon. A padded narrow wooden splint applied to the dorsal surface of the forearm and hand, extending from a few inches below the elbow to a point just above the metacarpophalangeal joints, will steady the fragment. A small pad should, however, be placed on the palmar side in the concavity of the base of the radius.

The entire question of splinting resolves itself into two factors, namely, to retain the reduction, and the preservation of the normal or approximately normal radial arch.

The main point in regard to the after-treatment is early motion of the joint. In the more serious cases this is employed every day for ten to fifteen minutes—at first passively, and on the third or fourth day active movements are substituted for passive. Do not permit the joints to stiffen, as this can be easily prevented by massage and early active and passive motion.

Two Cases of Leprosy Apparently Cured by Anthrax Vaccine.

ROUSSEL (*New Orleans Medical and Surgical Journal,* October, 1921) reports his cases in some detail, each treated by a liquid anthrax vaccine in doses of ¼ cc twice a week, gradually increasing to 1½ cc for about two months. The immediate effect was apparently negative, but two years later this patient reported and was found well, the lesions having begun to disappear two months after stopping the vaccine. This was apparently a typical case: macules on the patient's body, anesthetic tubercular infiltrations on her face, arms, and legs, forming in some cases large tubercular masses. Acid-fast bacilli were found.

The second case was given the anthrax vaccine at similar intervals for about two months, and as in the first instance appeared to be worse. Two years later she reported for some trivial skin affection and was apparently well of her leprosy.

Roussel does not claim originality for this treatment, referring to Dr. Campos, of South America, who, again, got his suggestion from another source. No claim is made that anthrax vaccine will cure leprosy, but the cases are reported as a stimulus to further trials.

Epididymotomy.

ALLEN (*The Military Surgeon,* October, 1921) observes that the classical method of treating epididymitis is to shave the parts, strap up testicle, and apply hot applications, with or without some drug. The course of this condition is very uncertain, total disability lasting from one to two months, and even then a large number of relapses occur. The infection travels down to the vas deferens, from the posterior urethra to the globus minor, which is located at the back and lower part of the testicle; thence it spreads up through the body of the epididymis to the globus major. These structures become hard and brawny, and feel like calcified bodies lying at the back portion of the testicle. Frequently there is associated with this condition an acute hydrocele, and this enlargement gives rise to the popular name "swollen testicle." There is an extravasation of blood and the formation of pus in the interior of the globus minor, major, and body of the epididymis, with great distention of these structures, so that they surround the testicle just as the bird's nest surrounds the egg. Very rarely is the testicle at all swollen; if it can be felt it will be found approximately normal in size, lying slightly within and in front of the swollen epididymis.

The classical treatment is unsatisfactory: (1) Because of the long time the patient is incapacitated. (2) Because of the large number of recurrences. (3) Because it violates one of the principles of modern surgery, which is, "When there is pus evacuate it." In a large proportion of the cases, under the classical method of rest, some portion of the epididymis is permanently

stenosed and the man is rendered sterile as far as that particular testicle is concerned. Hence the question of sterility in surgical interference need give us no particular concern.

Since the introduction of surgical interference in the treatment of gonorrheal epididymitis the operation has become popular among the victims of this disease, and were the surgical treatment not given the patients themselves would demand it for the relief it affords from pain if for no other reason. The pain in the cases reported in this series varied from that sufficient to keep a man off his feet, to agony which caused the patient to roll from side to side of the bed. Each of the patients operated on had temperatures ranging from 100° to 104°. Of these three were bilateral, sixteen right, and thirteen left. No accurate record has been kept of those suffering with an acute hydrocele, although a large proportion had this condition. The quantity of discharge from the penis varied from that of frank anterior urethritis to an entire absence, with only the history of a previous attack of gonorrhea. In the latter the gonorrheal nature of the process was confirmed by subsequent prostatic smear. The common feature of all was the hard nodular swollen condition of the body of the epididymis, globus minor and major. On the genito-urinary service of the author's hospital, to make a diagnosis of gonorrheal epididymitis is to operate. This stand has been taken because experience has shown that men with gonorrheal epididymitis, even though they may not have a severe condition when admitted, would if given the classical rest treatment develop excruciating pain and high temperature, accompanied by increased destruction of normal tissues as the result of the high tension. Even those cases which subside temporarily, if sent to duty two weeks after the subsidence, frequently return with a recurrence.

The operation is as follows: The patient having been anesthetized, a small incision is made in the scrotal wall posteriorly just above the globus minor. Grasping the testicle in the left hand to render it immovable, the globus major, minor and the body of the epididymis are opened by puncturing them with a pair of sharp-pointed hemostats held in the right hand. The hemostats are pushed in one-half to one centimeter and the jaws opened. This allows the escape of the exudate and pus, relieves tension, and secures drainage. This procedure is continued until all nodular masses are broken up. This latter is important, as each nodule or mass of nodules is a focus of infection which will continue to give trouble unless evacuated and drained. The point to be remembered is that the body of the epididymis, globus minor and major are no longer patent tubules but a series of small abscesses and blind pouches harboring necrotic and seminecrotic material, which must be thoroughly removed. If there should be an acute hydrocele the fluid escapes through the incision. Unless a small artery has been cut in making the incision no ligation is necessary. The blood and fluid escaping through this incision in several cases contained macroscopical pus. Upon withdrawal of the hemostat the wound is covered with gauze and the testicles placed on an adhesive plaster sling stretched between the thighs, and the patient then put back to bed. Upon awakening from the anesthetic the patients usually comment on the complete and absolute relief from pain. Only in three cases was any discomfort felt, and in these three cases the pain complained of was in the vas deferens where it passed through the inguinal canal; the pain in the testicle had ceased.

The epididymis in these cases did not return at once to its normal size, and although slightly swollen and tender upon firm pressure it was not in any sense painful. In no instance has there been a recurrence of the epididymitis, pain or swelling in the testicle, or in that region. In all, except one case, upon the relief of the acute hydrocele there was no return of this complication. This latter was a bilateral epididymitis with an enormous acute hydrocele, also bilateral. The hydrocele occurred in the left side to a moderate extent on the

second day, but disappeared on the fourth, after which the patient made an uneventful recovery. Whether the patients remained in bed three or four days, or got up the day after the operation, apparently had no effect upon the local condition, except that those who did get up were in a more cheerful frame of mind.

The ultimate results of epididymotomy are excellent. All of the thirty-two patients returned to full duty. There have been no after-pains, contractures, or painful scars, which so frequently follow varicocele and hydrocele operations. The patients themselves are thoroughly satisfied with the results. The more extensive operations involving complete exposure of the testicle and epididymis upon men suffering from gonorrheal epididymitis are hardly justified. The large incision and the increased manipulations only open up new avenues to infection, and the results could not be any better than those above described.

Sciatica.

JANSEN (*Lancet*, Oct. 1, 1921) observes that there has of late years been a tendency to look at the neuralgias as forms of neuritis. Helweg states somewhat dogmatically that "sciatica is a disease of the kinetic system, caused by overwork, and dependent upon disturbance of muscular coördination." Osteoarthritis deformans coxæ may, for example, be the starting-point. Chronic hip disease leads to more or less contracture or spasm of the local muscles. They perform static work, which is very fatiguing. If the patient continues to get up and do his work, which means that in addition to the static work the muscles have also to perform ordinary (dynamic) work, then the hip muscles get overtired, and this will mean greater demands on the other muscles "of the same synergic group;" that is to say, muscles which take part in the performance of the same function—for example, in the case of walking, the muscles on the posterior aspect of the thigh. By degrees these muscles may also become exhausted and the hyperfunction reach right down the leg. The same thing takes place in spondylitis deformans, where the point of origin is the disease in the vertebral column, which leads to "static function of the erector spinæ muscles in order to fix the affected area." Lastly, "unsuitable attitudes assumed during work, or working at an inconvenient rate," can produce the same result, because certain groups of muscles become exhausted, with the result that others have to function excessively, and so on.

As is rightly pointed out by Wertheim Salomonson, it is not the nerve trunk but its cutaneous branches which are tender and give rise to the "points douloureaux" of Valleix. This condition is known in another undoubted nervous disease—alcoholic polyneuritis. In this complaint the nerve trunks are relatively only slightly painful, while the muscles are extremely painful.

Linstedt supports the following view:

Sciatica, in the large majority of cases, is a pure neuralgia, a functional disease without anatomical findings in the nerve. It arises from the presence of painful or merely irritating conditions in the periphery of the nerve which cause pain radiating into the whole of the sciatic area, in the same way that toothache can produce trigeminal neuralgia. The irritation must have a certain amount of persistence or strength, and the person must have a susceptibility to neuralgia. If the susceptibility, "the neuralgic disposition," is great—in other words, if the individual is markedly neurasthenic—the "irritamentum" need only be trifling.

In an investigation of 100 cases of sciatica Linstedt claims to have found the irritamentum in 91.

Ljungdahl only deals with sciatic pain in spondylitis deformans and osteoarthritis deformans coxæ. He is not out to show that the pain is caused by these maladies, but simply constructs an hypothesis for the way in which they arise. The hypothesis is this: the pain is a reflex phenomenon similar to Mackenzie's viscero-sensory reflex. What gives rise to the reflex is the early destruction in the diseased portion of the bone or cartilage. He regards the condi-

tions as traumata threatening the tissues with destruction or breaking down. The pain is the patient's signal of distress; the simultaneous contractures in the surrounding muscles are similarly the self-defence of the organism, analogous to Mackenzie's visceromotor reflex.

As to the symptoms of sciatica, the pain follows the course of the nerve, particularly the cutaneous branches with their sensory fibers; also the branch coming directly from the sacral plexus, namely, the small sciatic nerve. The latter reaches as far as the popliteal space, and it is possibly its end branches which are responsible for hypersensitiveness in this situation. Valleix's points are for the most part caused by the cutaneous branches. On the leg and foot they are the cutaneous branch of the internal popliteal nerve, the external cutaneous, the external saphenous, and the cutaneous branches of the internal plantar nerve. Lasegue's sign can easily be elicited in most cases by stretching the nerve, but it must be admitted it can also be obtained by stretching the contracted hamstring muscles, in the form of referred pain in the nerve. Some people have extremely short hamstring muscles, so that stretching begins much earlier than usual on both sides. Anesthesia and paralysis—and, presumably, also absence of the Achilles tendon reflex—should probably be taken as a sign of neuritis. Atrophy is most frequently due to inactivity.

Ordinary uncomplicated sciatica is a benign disease which of itself tends to get well. When it appears to be chronic, it is either because it is secondary to one of the many cited chronic complaints, or because it has produced a kind of traumatic neurosis in the patient. In such a case it can always be dissipated by appropriate suggestion. In treating sciatica the neurasthenic element must always be kept in mind. Bromides are therefore good drugs to administer, and excellent results can be obtained by the most diverse means, from the ordinary camphor oil injections to cauterization of the external ear. Injections of salt water also have a transitory deadening effect. The first part of the treatment should be designed to combat the muscle cramps and contractures. Heat and massage are the sovereign remedies. The massage should be "dispersing," and principally applied to the lumbar and gluteal regions. Friction and similar stimulating manipulation of the nerve are useless. The musculature of the whole extremity, later on in the treatment, will benefit from massage directed against atrophy. And, finally, at the close of treatment of every case of sciatica, remedial gymnastics should be prescribed to revive the natural function and correct the acquired faulty position.

Reviews

OPTIMISTIC MEDICINE. The F. A. Davis Company, Philadelphia, 1921.

As a subtitle to the heading "Optimistic Medicine" we find the words "The early treatment of simple problems rather than the late treatment of serious problems," and the title-page further tells us that the text is written by a "former insurance man," no name being given.

The author thinks that between the technical knowledge of the physician and the legendary instincts of the average citizen there is a space of "no man's land," which accounts for many sudden disappearances from these earthly scenes. He thinks it would be well if the physician could bridge the gap between his knowledge and the ignorance of his clients, giving the latter a greater amount of information in regard to physiology and hygiene as a mutual basis for consultation. He believes that the hygienic blunders in many families are more serious than the traditional "crimes."

The book is divided into sixteen chapters,

the first of which deals with optimism as a remedial measure; the next with coöperation between doctor and patient; then he takes up immunity to disease; childhood and its problems; adolescence and the family doctor; the house-mother who worries; the tubercular (sic) suspect; the overworked business man; the early grandmother stage; and then proceeds to discuss the diseases among the aged, the preserving of the special senses, and the retaining of efficiency late in life. There is also a chapter entitled "Mental Torture of the Body." The last chapter bears the title "Getting Back to that which is Natural." He expresses the belief that physicians should be advisers in household economics.

Why the author should have desired to be anonymous is a mystery. As a matter of fact the book is very cleverly written, is excellently printed in large type, and contains an immense amount of common sense which might be injected, so to speak, into many people with great advantage, and if so injected, or absorbed, and properly utilized, might very readily materially diminish many of the annoyances to which a physician must now submit when he recognizes that the patient's ignorance is fundamentally the cause of trouble to himself and in the life of the physician as well.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., LL.D., assisted by L. F. Appleman, M.D. Volume IV, December, 1921. Lea & Febiger, Philadelphia, 1921.

This issue of Progressive Medicine contains, as has the December issue since the publication was started, many years ago, articles upon "Diseases of the Digestive Tract and Allied Organs," by Dr. Martin E. Rehfuss, Associate in Medicine, Jefferson Medical College, whose work in gastroenterology is so well known; one upon "Diseases of the Kidneys," by Dr. Henry R. Geyelin, Associate in Medicine in the College of Physicians and Surgeons, New York; one upon "Genito-Urinary Diseases," by Dr. Charles W. Bonney, of the Jefferson Medical College; the fourth deals with "Surgery of the Extremities, Shock, Anesthesia, Infections and Fractures, Dislocations and Tumors," by Dr. W. E. Lee, Surgeon to the Germantown and other Hospitals; and last of all, "A Practical Therapeutic Referendum," by Dr. H. R. M. Landis, Assistant Professor of Medicine in the University of Pennsylvania.

As we have often pointed out on previous occasions, the idea is that each author shall write a story of the progress which has been made in his particular department during the preceding twelve months, with such additions and criticisms, as he writes the story, as will add materially to the value of his summarization of the subject. We believe that the present volume fully maintains the high standard set by its predecessors.

NOUVEAU TRAITÉ DE MÉDECINE (Fascicule III) Maladies Infectieuses (Suite). Publié sous la direction de G. H. Roger, Fernand Widal, P. J. Teissier. Un Volume de 556 pages avec 62 figures et 4 planches en couleurs. (Masson et Cie, Editeurs.) 40 fr. net.

NOUVEAU TRAITÉ DE MÉDECINE (Fascicule VII) Avitaminoses, Maladies par Agents Physiques, Troubles de Nutrition (Suite). Publié sous la direction de MM. Les Professeurs G. H. Roger, F. Widal, P. J. Teissier; Secretaire de la Redaction; Marcel Garnier. Un Volume de 536 pages avec 32 figures dans le texte. (Masson et Cie, Editeurs.) 35 fr. net.

This volume (Fascicule III) of the Nouveau Traité de Médecine (Fascicule I and II were reviewed in an earlier issue of the THERAPEUTIC GAZETTE) deals with typhoid fever and its allies, colon-bacillus infections, the dysenteries, cholera, Malta fever, trench fever, influenza, plague, and yellow fever.

The article on typhoid fever by Widal, Lemierre and Abrami is masterly, and while not as full as Curschmann's on the same subject in the Nothnagel System contains in a smaller space all the essentials, arranged with the precision and sequence characteristic of the French. The bacteriology is very exhaustively treated, with due attention to the cultural and biological methods of differentiation of the organisms of the typhoid and colon-bacillus groups. The section on etiology and pathology occupies 85 pages; that on symptomatology 90;

that on treatment does not fare so well, the whole section on the treatment of typhoid and paratyphoid and their complications taking up only 16 pages. With regard to specific treatment the authors feel that antityphoid serum is not constant in its action owing to the inability of producing in horses a reliable antitoxin. Vaccine therapy is indicated in cases of average or benign character and should be used in the first stages of infection. In the more severe cases and in cases of long standing, the results are not satisfactory.

In the chapter on colon infection (Colibacillosis) by Widal and Lemierre intravenous injections of colloidal metals are advised in treatment. When the infection is severe and unilateral in the urinary tract, nephrotomy or nephrectomy may be indicated.

The section on bacillary and amebic dysentery by Dopter is very satisfactory, but in contradistinction to the articles by Widal and his coworkers contains very few references to the literature. Cholera is discussed in an exhaustive way by Sir Marc Armand Ruffer and Milton Crendiropoulo.

The article on botulism is very brief in view of the growing importance of the subject; it also lacks mention of the recent literature, especially the American.

Trench fever is discussed by Robert P. Strong in a characteristically thorough manner. Strong maintains that the body louse is the sole transmitter of the disease, as was first demonstrated by the American Red Cross Commission.

The section on influenza is long and thorough. The influenza bacillus is not held to be the cause of the disease. In the author's opinion grippe by itself is never fatal, but death is always due to complications, especially to pneumonia. It is the belief of the reviewer that influenza-pneumonia as it was encountered in the epidemic of 1918 was not in its essence a complication but a condition due to an extremely severe infection with the influenza virus, whatever that may be.

The article on yellow fever by Sodré is fully up to date, including as it does reference to the researches of Noguchi on Leptospira icteroides. The author, however, does not fully indorse Noguchi's conclusion as to the specificity of this organism.

Fascicule VII, which is the third of the series issued, deals with vitamines and avitaminoses, scurvy, pellagra, beriberi, snake-poisoning, anaphylaxis and serum disease, diseases due to physical agents, and metabolic disturbances.

In the avitaminoses, the important contributions of American investigators such as McCollum, Hess and others are noted. The article on pellagra, while referring to the researches of Goldberger, overlooks a good deal of the work of American students of this disease. Much more importance is given to the Sambon theory of insect transmission than is customary in American articles on pellagra. The treatment is rather inadequately disposed of in little more than a page. The article on snake-poisoning by Calmette is naturally excellent.

Anaphylaxis and serum sickness are treated in separate chapters by different authors. In the section on diseases due to physical agents, mountain sickness, aviators' disease, and kindred subjects are considered. A very excellent chapter is incorporated on disturbances due to electrical discharges. In the chapter on metabolism, one finds a lengthy discussion of the two conditions that for years have occupied such a prominent place in French medicine—arthritism, or the bradytrophic diathesis, and lymphatism.

In a subsection on acid poisoning, all of the possible acids that can be formed in the body are mentioned, though acidosis as such is not here considered. A number of pages, about 7, are devoted to the oxalic dyscrasia, oxalemia and oxaluria.

The chapter on obesity is comprehensive and thoroughly scientific.

In the section on diabetes mellitus a rather disproportionate amount of space is given to general considerations in comparison with that devoted to prophylaxis and treatment of the disease and its complications. Credit for the fasting treatment is given solely to Guelpa, the much more fundamental work

of Allen not being mentioned. The term pseudo-diabetes to include various forms of polyuria is unnecessary and not altogether rational. A long exhaustive article on gout and brief ones on cystinuria and alcaptonuria complete the volume.

No one can read the chapters on infections and on metabolic diseases without great satisfaction. If there is any disappointment, viewing the work as a whole, it is in the French approach to treatment, which, somehow, is more detached and less practical than our own.

On the scientific side the great power of generalization and the lucidity of statement possessed by the French and exhibited in the Traité will make the perusal of the volumes a source of pleasure and inspiration. D. R.

SUBMUCOUS RESECTION OF THE NASAL SEPTUM. By W. M. Dunning, M.D. Surgery Publishing Company, New York, 1922. Price $1.50.

The numerous opportunities which Dr. Dunning has had in connection with the hospitals in New York, in the departments of rhinology and otology, qualify him for the preparation of such a text as is now before us. Naturally the book is a small one, dealing, first, with the function of the nose as a respiratory organ and as one connected with the sense of smell, and then with common deviations of the septum, general surgical procedures which are advisable, and special surgical procedures. These parts are followed by typical case histories. The method of treating the so-called saddle-back nose is also discussed.

The main idea of the book in one sense is the use of no less than twenty-five specially prepared drawings to illustrate the scope and manner of the operation which Dr. Dunning believes to be most advantageous. This operation, though simple, is by no means easy, and, as a rule, should be performed only by those who have special training. This book is of value to the general practitioner indirectly, but will doubtless prove most useful to the younger members of the profession who are devoting themselves to rhinology.

EARLY DIAGNOSIS OF THE ACUTE ABDOMEN. By Zachary Cope, B.A., M.D., M.S. Lond., F.R.C.S. Eng. Henry Frowde and Hodder & Stoughton, London, 1921; and Oxford University Press, New York, 1921.

Cope has taken as the subject of his excellent brochure a condition of vital importance to every member of the profession, one which, in spite of the urge of the surgeon, has not received at the hands of the general practitioner that consideration which it deserves. He has lucidly set forth the principles of diagnosis in acute abdominal disease. He lays down as an axiom that the majority of severe abdominal pains which ensue in patients who have been previously fairly well, and which last as long as six hours, are caused by conditions needing surgical intervention. He quotes from the Registrar-General's report for England and Wales for 1918 the following figures: There died from gastric ulcer nearly 2000 people, acute appendicitis nearly 2500, from acute intestinal obstruction 2848, and from hernia 2200. These were in the main preventable deaths, but preventable only on the condition that surgical diagnosis had been made and surgical measures promptly adopted.

His second and third chapters are devoted to Method of Diagnosis, and dwell particularly upon the history. He draws attention to what he calls the thigh rotation test, holding that when there is any inflamed mass adherent to the fascia over the obturator internus muscle, rotation of the flexed thigh, so as to put the irritated muscle through its full movements (especially internal rotation), will cause hypogastric pain.

The fourth chapter deals with Appendicitis. He notes that in the inflamed acute appendix rigidity is frequently present, but in quite a large proportion of cases it is almost constantly absent in the early stages, and in some cases is absent even though pelvic peritonitis exists.

He calls attention to a sign described by the late Mr. Edmund Owen which may prove of use in some cases. He stated:

"If in a case of appendicitis, when the

colon contains much gas, firm pressure is made with the hand over the ascending colon, the gas is forcibly drawn towards the cecum, and, the inflamed tissues being disturbed, the patient may complain of pain in the right iliac fossa."

The epigastric pain in the majority of cases is first referred to the epigastric or umbilical region, and only later is localized in the right iliac fossa. There are two facts about the retrocecal appendix which need special mention. Pain is usually less, and is often from the first felt only locally. Vomiting is not so frequent, and generally the muscular rigidity over the disease focus is less than would be expected for so advanced a lesion.

The irritation and reflex rigidity of the iliopsoas frequently cause the patient to hold the right thigh flexed, or with a less degree of irritation pain may be felt only if the right thigh be fully extended as the patient lies on the left side. In a few cases pain and hyperesthesia may be noted along the distribution of the external cutaneous nerve.

An excellent chapter on Differential Diagnosis, Perforation of a Gastric or Duodenal Ulcer, Acute Pancreatitis, and Acute Intestinal Obstruction—these are considered in turn.

Thereafter follows discussion of Intussusception, Cancer of the Large Bowel, Volvulus; The Early Diagnosis of Strangulated and Obstructed Herniæ. There is a chapter on Acute Abdominal Symptoms in Pregnancy and the Puerperium; an excellent chapter on the Colics, and a brief discussion of the early diagnosis of abdominal injuries; some annotations on the acute abdomen in the tropics, including hydatids, acute liver abscess, dysentery, typhlitis, and perforation of typhoid ulcer.

There is a chapter on Acute Inflammatory Disease with Genito-urinary Symptoms, and finally a chapter on Diseases which may Simulate the Acute Abdomen. An excellent summary evidently based on a large individual experience systematically set forth and useful to every practitioner of medicine.

Correspondence

Luminal in Epilepsy.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: The results of the use of luminal in "custodial" cases, *i.e.*, asylum cases, as described by Drs. Jackson and Free in their recent contribution published in the THERAPEUTIC GAZETTE of December 15, 1921, should not influence us in the treatment of ordinary cases of epilepsy. In the asylums we have to do with cases of epilepsy so far advanced in their degeneration that mental symptoms have led to institutional restraint, and also with other mental diseases in which epileptiform attacks are merely symptomatic of an underlying mental disease. In the ordinary, so-called essential form of epilepsy, as met with in general practice, no remedy has proved of so much value as luminal, and in the doses in which it has been used—*i.e.*, a grain or a grain and a half daily, limited to but one administration in the twenty-four hours, namely, at bedtime—no harm has been observed to follow its use. Indeed the results have been most beneficial, not to say remarkable. The seizures are inhibited for long periods of time and in some cases altogether, no recurrences being noted. At the same time there is a marked improvement in the patient's general health. What the results of the administration of luminal in large doses would be, especially in persons presenting serious degenerative mental disease, opens up an entirely different problem. A sharp distinction should be made in the application of luminal in these two groups of cases.

Very respectfully yours,

F. X. DERCUM, M.D.

PHILADELPHIA.